Factors that influence the effectiveness of received support in sport

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Abstract

The presence of supportive relationships is crucial in various contexts, but received support is sometimes ineffective or even detrimental. Using the support adequacy model as a key framework, this thesis examined the effects of support (in)adequacy on outcomes, whether these relationships generalised across cultures, were moderated by requested support, and mediated by support satisfaction.

Chapter 2 comprises two experimental studies which found support (in)adequacy predicted psychological outcomes and performance (Study 2 only). Adequate support (received support as wanted) was generally associated with more favourable outcomes, and underprovision (received less support than wanted) was associated with less favourable outcomes. The effects of overprovision (received more support than wanted) were mixed.

Chapter 3 comprises a cross-sectional, survey study conducted in British and Chinese athletes. Polynomial regression analyses revealed that across both samples: 1) adequate support was associated with more favourable psychological outcomes, especially at higher levels of received and wanted support; 2) overprovision was associated with more favourable outcomes than underprovision; 3) effects generally operated indirectly through satisfaction with support.

Chapter 4 comprises a prospective study with UK university athletes. The effects of support (in)adequacy on Time 2 outcomes were moderated by requested support. At high requested support, the effects replicated those in Chapter 3. At low requested support, adequate support was associated with more favourable psychological outcomes, but overprovision became as detrimental as underprovision.

Overall, the thesis found that received support was associated with more favourable outcomes when it was congruent with what athletes wanted, these findings

were robust across cultures and study designs, furthermore the effects were moderated by requested support, and mediated by support satisfaction. The findings provide evidence for, and extend the predictions of, the support adequacy model, and demonstrate that novel insights can be provided by using polynomial regression in social support research.

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Chapter 1: General Introduction and Literature Review

The Importance of Social Support

Social support is an important psychosocial factor for physical and mental wellbeing (e.g., Cohen & Wills, 1985; Thoits, 2011). For example, social support has been linked to enhanced self-esteem, self-efficacy, and feelings of personal control (Cohen, Gottlieb & Underwood, 2000), reduced depression and anxiety (Brissette, Cohen, & Seeman, 2000), decreased blood pressure and heart rate (Umberson & Karas Montez, 2010), improved immune function (Cohen, 2004), and lower rates of morbidity and mortality (Uchino, 2006). Additionally, social support has played a very important role in interpersonal relationships such as intimacy, closeness, trust, perceived acceptance, and quality and satisfaction of relationships (e.g., Cutrona, 1996; Rafaeli & Gleason, 2009).

Similarly, the importance of social support has been recognised in sporting contexts (Bianco & Eklund, 2001). Social support is beneficial for coping with injury-related stressors (Rees, Mitchell, Evans, & Hardy, 2010), return from injury (Carson & Polman, 2012), intentions of remaining in sport organisation (Spoor & Hoye, 2014), self-ruling exercise management and intentions (Wilson et al., 2004), and burnout (Raedeke & Smith, 2004). Furthermore, social support predicts a range of performance-related outcomes such as flow states (Rees & Hardy, 2004), athletes' self-talk (Zourbanos et al., 2011), perceptions of situational control and challenge appraisals (Freeman & Rees, 2009)), self-efficacy (Rees & Freeman, 2009), and self-confidence (Rees & Freeman, 2007; Freeman & Rees, 2010), as well as performance outcomes (Freeman & Rees, 2008; Moll, Rees & Freeman, 2017; Rees & Freeman, 2010). Despite this evidence, social support is not always beneficial in sport. Indeed, social support is sometimes judged by athletes as more unhelpful than beneficial (Udry, Gould, Bridges, & Tuffey, 1997), can be ineffective in reducing athletes'

feelings of depression and anxiety (Yang et al., 2014), and has been associated with greater negative affect (Freeman, Coffee, Moll, Rees, & Sammy, 2014). This thesis, therefore, examined factors that influence the effectiveness of received social support. To achieve this goal, four studies (presented across three chapters) were conducted that measured various types of social support (wanted, received, requested and satisfaction) and their relationship to performance-related factors (affect, self-confidence and objective task performance) among athletes. The following literature review defines what social support is, explores the inconsistent effects of different types of social support, critically appraises the limitations in previous research, and provides a rationale for the importance of investigating factors that influence the effectiveness of received support in sport.

Definitions of Social Support

The concept of social support can be traced to studies in the 1970s when it was defined by numerous researchers (e.g., Cassel, 1976; Cobb, 1976; Henderson, 1977). Social support was defined by Cobb (1976) as "*information leading the subject to believe that he [she] is cared for and loved, esteemed, and a member of a network of mutual obligations*" (p. 300). Similarly, social support was described by Cassel (1976) as the feedback from individuals' primary group (e.g., their family, relatives, and friends) that can protect them from stressors. Henderson (1977) referred to social support as individuals' basic needs and desires that must be satisfied. All these studies (Cassel, 1976; Cobb, 1976; Henderson, 1977) suggested that social support may be beneficial to individuals' mental and physical health.

Subsequently, various researchers offered alternative definitions of social support. For instance, Sarason, Sarason and Pierce (1990) described it as "*Knowing that one is loved and that others will do all they can when a problem arises*" (p.119),

and Cutrona (1996) defined social support as "*acts that demonstrate responsivity to another's needs*" (p. 17).

Different Perspectives

Most recent researchers have emphasised that social support is a multidimensional construct which includes structural and functional perspectives (e.g., Cohen et al., 2000; Vangelisti, 2009).

Structural perspective. The structural perspective focuses on social support in terms of social integration, including the extent to which an individual is interconnected within a social support network (Berkman, Glass, Brissette, & Seeman, 2000). Social support networks comprise of all social relationships that can potentially provide the supportive behaviours (Scarapicchia, Amireault, Faulkner, & Sabiston, 2017). Measures of social integration include the size of networks, the intensity and frequency in which a person participates in social activities, and the extent of an individual's belief that he/she belongs to a certain community (Berkman et al., 2000; House, Kahn, McLeod, & Williams, 1985).

Structural perspective in general psychology. Social integration (e.g., structural support) is beneficial for physical and mental health, such as decreased mortality risk and increased positive moods (Berkman et al., 2000; Holt-Lunstad, Smith & Layton, 2010; Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015; Thoits, 2011). More specifically, people who are well integrated within their social support networks have better health and well-being, such as less susceptibility to infectious diseases (Cohen, Doyle, Sknoer, Rabin, & Gwaltney, 1997), less mortality of heart disease and less recurrence rate of cancer (Cohen et al., 2000), and lower levels of stress and depression, and better life satisfaction (Fuller-Iglesias, 2015).

Structural perspective in sport psychology. There is little empirical evidence

regarding the relationship between structural support and performance-related outcomes in a sporting context. Several qualitative studies, however, have illustrated the importance of athletes being integrated within a supportive network (Rees & Hardy, 2000; Udry et al., 1997). Athletes' social ties including their family, friends, sport-related staff and communities (e.g., teammates, coaches, trainers, and their clubs) are key factors for a successful sports career (e.g., Hassell, Sabiston & Bloom, 2010; Schinke et al., 2006). Despite this evidence, some elite athletes have reported that they are more stressed and performed more poorly when their coaches were present to watch their events (Kristiansen & Roberts, 2010).

Limitations of structural perspective. The total social support process is not uniquely demonstrated by its structural perspective, because quantifying individuals' social networks does not identify the type and amount of supportive behaviours they provide (Rees & Hardy, 2000; Reeves, Nicholls & McKenna, 2009). Indeed, the mere presence of supportive others can lead to adverse effects on individuals' psychosocial outcomes (e.g., more perceived stress), bio-physiological responses (e.g., heightened blood pressure) and performance (Allen, Blascovich, Tomaka, & Kelsey, 1991; Kane, McCall, Collins, & Blascovich, 2012). The functional perspective, therefore, offers a complementary perspective that helps to more fully understand the role of social support across diverse contexts (Holt-Lunstad et al., 2010).

Functional perspective. Uchino (2004) emphasised that the functional perspective of social support focuses the specific functions provided by members of an individual's social network. There are two major types of functional support: perceived support and received support (Lakey, 2010; Uchino, 2009). Perceived support and received support are distinct types of support, which are only weakly correlated to each other, have different measures, and show unique correlations with

other constructs (Haber, Cohen, Lucas, & Baltes, 2007; Lakey, 2010). Both perceived and received support can be further divided into specific dimensions, which have been identified by researchers in both social (e.g., Cutrona & Russell, 1990) and sport (e.g., Rees and Hardy, 2000) psychology: emotional (providing comfort, security, love, and care), esteem (enhancing one's sense of competence or self-esteem), informational (giving advice and guidance), and tangible support (offering practical and instrumental assistance).

Perceived support. Perceived support refers to individuals' perceptions that social support will be available in times of need (Lakey, 2010; Uchino, 2009). This subjective judgment of support should be stable over long periods of time and across situations (Sarason & Sarason, 2009). Uchino (2009) argued that individuals' perception of support availability might originate from their early familial experience (also see Sarason, Sarason & Shearin, 1986), and perceived support might be correlated to personality traits or other individual difference characteristics such as secure attachment styles and high optimism (Uchino, Vaughn, & Matwin, 2008).

Perceived support in general psychology. Perceived support is beneficial for a wide range of physiological and psychological outcomes. For example, high levels of perceived support have been linked to lower mortality (Berkman, Leo-Summers, & Horwitz, 1992), decreased cardiovascular reactivity (Smith, Ruiz, & Uchino, 2004), reduced blood pressure (Steptoe, Lundwall, & Cropley, 2000), reduced illness risks (Cohen, Janicki-Deverts, Turner, & Doyle, 2015), improved self-esteem and less depression (Symister & Friend, 2003), better feelings of situational control (Atienza, Quarells, & King, 2001), improved relationship satisfaction (Shorey et al., 2015), more positive emotions and fewer negative emotions (Lakey & Rhodes, 2015), and relieved symptoms of post-traumatic stress disorder (Platt, Keyes, & Koenen, 2014).

Perceived support in sport psychology. In sport, perceived support has been associated with psychological resilience (Fletcher & Sarkar, 2012), better psychological responses to injury such as less devastation (Mitchell, Evans, Rees, & Hardy, 2013; Rees et al., 2010), improved self-confidence (Freeman & Rees, 2010; Rees & Freeman, 2007) and self-efficacy (Rees & Freeman, 2009), enhanced situational control (Freeman & Rees, 2009), less burnout (Freeman, Coffee, & Rees, 2011), greater performance-related states (Rees & Hardy, 2004; Rees, Ingledew, & Hardy, 1999), better performance (Freeman & Rees, 2008, 2009), fewer frequencies of concussions (Baugh, Kroshus, Daneshvar, & Stern, 2014), greater job satisfaction (Spoor & Hoye, 2014), stronger self-determined motivation for sport participation (DeFreese & Smith, 2013), and better work attitudes (Kim, 2017).

Received support. Received support refers to individuals' reported receipt of supportive resources and actual supportive behaviours, usually during a specific time period or event (Lakey, 2010; Uchino, 2009). Compared to perceived support, received support referred to a more situational perspective that individuals coped with stressful circumstances (Barrera, 2000; Uchino, 2009).

Received support in general psychology. In contrast to the strong and consistent evidence for the beneficial effects of perceived support, received support has not been commonly associated with physical health and mental well-being outcomes (Feeney & Collins, 2014; Uchino, 2009). Some studies have found that received support is associated with beneficial effects on martial adjustment (Barry, Bunde, Brock, & Lawrence, 2009; Xu & Burleson, 2004), perceived closeness (Gleason, Iida, Shrout, & Bolger, 2008), life satisfaction (Finch et al., 1997), health-related quality of life and self-efficacy (Arora, Finney Rutten, Gustafson, Moser, & Hawkins, 2007), depressive symptoms and adaptation to vision loss (Reinhardt,

Boerner, & Horowitz, 2006), and more socioeconomic resources and better self-management in individuals with multiple sclerosis (Wilski, Tasiemski, & Kocur, 2015). Other studies, however, have found received support to be ineffective or even associated with unfavourable effects (Feeney & Collins, 2014; Thoits, 2011; Uchino, 2004, 2009; Uchino, Carlisle, Birmingham, & Vaughn, 2011). For example, received support has been found to be associated with increased levels of mortality (Krause, 1997), a poorer sense of control and independence (Martire & Schulz, 2007), decreased self-esteem (Nadler & Fisher, 1986), limited reduction in cardiovascular arousal (Kordahji, Bar-Kalifa, & Rafaeli, 2015), and increased negative emotions (Barry et al., 2009; Finch et al., 1997; Gleason et al., 2008; Knoll, Magis-Weinberg, Speekenbrink, & Blakemore, 2015; Liang, Krause, & Bennett, 2001; Reinhardt et al., 2006). The potential explanations for the inconsistent effects of received support will be presented in the next section.

Received support in sport psychology. In sport, several qualitative studies have found that received support can be beneficial to athletes when coping with stressful events, including competitive and organisational stressors (Kristiansen & Roberts, 2010), returning to competition from injury (Carson & Polman, 2012), and more general problems during sports careers and daily life such as lack of concerns (Hassell et al., 2010; Rees & Hardy, 2000). Equally, quantitative evidence has shown that received support is associated with higher self-confidence (Rees & Freeman, 2007), more positive self-talk (Zourbanos et al., 2011), willingness to expend more effects in the tasks (Hüffmeier et al., 2014), better psychological well-being (Katagami & Tsuchiya, 2016), and better performance (Freeman & Rees, 2008; Moll et al., 2017; Rees & Freeman, 2010; Rees, Hardy, & Freeman, 2007). However, athletes suffered a larger amount of injuries when they reported more frequencies of

support, as support might be a distraction or overmotivation during competition (Hardy, Richman, & Rosenfeld, 1991). Further, Udry et al. (1997) indicated that not all supportive behaviours are beneficial to athletes, as athletes considered their social interactions as more negative than positive. Most recent studies have also found that received support was ineffective in helping athletes in terms of burnout, self-determined motivation, depression and anxiety (DeFreese & Smith, 2013; Yang et al., 2014). Moreover, some studies have begun to investigate the factors that influence the effectiveness of received support in sport. Specifically, when injured athletes received more support, those who had low levels of hope (i.e., the perception of achieving one's desired aim) experienced better subjective well-being (i.e., life satisfaction and affect), compared to those who had high hopes (Lu & Hsu, 2013). Under a low stress environment, athletes who received high levels of tangible support experienced more negative affect than those who received lower levels of tangible support (Freeman et al., 2014). When athletes received tangible support from their teammates rather than coaches, they had lower self-confidence (Katagami & Tsuchiya, 2017). In summary, perceived social support appears to be universally beneficial for physical and mental health among different populations (e.g., Feeney & Collins, 2014) and for a host of important outcomes in athletes (e.g., Freeman et al., 2011). In contrast, the effects of received social support appear to be weaker and more variable (e.g., Uchino et al., 2011). It is therefore important to investigate possible explanations for the inconsistent effects of received support and understand the nuances of when support is most beneficial.

Explanations for Inconsistent Effects of Received Support

There are multiple psychological mechanisms that may explain the mixed effects of received support, such as threatened self-esteem (Fisher, Nadler, &

Whitcher-Alagna, 1982; Nadler & Fisher, 1986), undermined autonomy (Ryan & Solky, 1996), and increased inequity (i.e., people who receive more support than they provide may feel indebted) (Gleason, Iida, Bolger, & Shrout, 2003; Nahum-Shani, Bamberger, & Bacharach, 2011). Moreover, recognising support was provided by others (i.e., visible support) has been found to result in more adverse effects than supportive behaviours which were delivered outside of recipients' recognition or provided subtly (i.e., invisible support) (Bolger & Amarel, 2007; Bolger, Zuckerman, & Kessler, 2000; Shrout et al., 2010; Shrout, Herman, & Bolger, 2006). The receipt of support may also inadvertently highlight the stressful situation and the difficulties being faced, which may lead to worse psychological and physical health (Beehr, Bowling, & Bennett, 2010).

Uchino and colleagues (2011) argued there are three broad categories of factors that may moderate the effects of received support: (1) task-related factors, for instance, the most effective dimension of support should match the needs created by stressors (e.g., Rees & Hardy, 2004), (2) recipient-related factors, such as whether one has desires for support (e.g., Dehle, Larsen, & Landers, 2001), and (3) provider-related factors, such as different types of relationship between support providers and recipient (Katagami & Tsuchiya, 2017). This framework may help to more accurately explain the inconsistent effects, as the three categories of factors begin to illustrate the complexity of effective social support exchanges (Uchino et al., 2011). In general, support providers may misunderstand recipients' needs, leading to recipients receiving support at the wrong time or from the wrong people (Shinn, Lehmann, & Wong, 1984). Similarly, miscarried helping, namely that even though support is well-intended and well-delivered, fewer benefits may occur if the support is excessive, improper, or unwanted (Coyne, Wortman, & Lehman, 1988; Fales, Essner, Harris, &

Palermo, 2014).

The Person-Environment Fit Model

Shinn et al. (1984) claimed that the theory of Person-Environment fit (P-E fit) may explain the (in)effectiveness of received support. The P-E fit theory was defined as the extent to which individual characteristics or circumstances match the environmental characteristics or resources (Caplan, 1987; Edwards, 2008; Kristof-Brown, Zimmerman, & Johnson, 2005; Cheri Ostroff & Schulte, 2007). In accordance with this theory, the receipt of support can be viewed as an environmental resource, and its effectiveness will vary depending on its match with individual circumstances (i.e., the extent to which support is [un]wanted) (Beehr et al., 2010). Beehr et al. (2010) found that individuals were more likely to benefit from received support when they had a desire for it, and that they experienced more emotional exhaustion and poorer physical symptoms when they received unwanted support. Similarly, the importance of being independent was considered as an individual circumstance that influences the effectiveness of received support (Matire, Stephens, Druley, & Wojno, 2002). According to Matire et al. (2002), people who perceived that completing tasks independently was important, experienced a feeling of powerlessness when they received support, and the powerlessness led to fewer positive health behaviours and more depressive symptoms.

The Support-Matching Model

Support-matching in general psychology. Cohen and McKay (1984) underlined the importance of the dimension of functional support received meeting the particular needs created by stressful situations. This theory was further developed by Cutrona and Russell (1990) into the optimal matching model. For instance, providing informational support to people may be beneficial in the face of

performance failure, but ineffective when they have suffered the end of romantic relationship (Horowitz et al., 2001). According to the optimal matching model, the needs of individuals are determined by situational demands, particularly whether a stressor is controllable or uncontrollable (Cutrona & Russell, 1990). In principle, controllable situations (e.g., work stress) were proposed to elicit a need for problem-focused support (e.g., informational support), and uncontrollable situations (e.g., unemployment) were matched with emotion-focused support (e.g., emotional support) (Cutrona & Russell, 1990).

Support-matching in sport psychology. The optimal matching model has been applied in sport psychology. In a study by Rees and Hardy (2004), athletes had a higher state of flow when perceived emotional or esteem support was matched with an uncontrollable stressor (competition pressure) and informational or tangible support was matched with a controllable stressor (technical problems in training). Similarly, several researchers (Park & Kim, 2014; Rosenfeld & Richman, 1997) have emphasised that when received support is mismatched with an athlete's needs, the support can be ineffective or even lead to unfavourable outcomes. However, Rees, Hardy, and Freeman (2007) found that emotional-focused and problem-focused support was associated with better performance irrespective of matching the (un)controllability of the stressors.

Limitations of support-matching. Despite its conceptual promise and some supporting literature, overall the optimal matching model has received mixed empirical support (Burleson & MacGeorge, 2002; Cutrona & Suhr, 1994). This inconsistent evidence may be because individuals can differ in which specific dimensions of support they want to receive (Gardner & Cutrona, 2004). Indeed, there are additional factors that may influence support needs rather than the

(un)controllability of a situation (Rini & Dunkel Schetter, 2010). For example, it may be important to explore what support individuals subjectively want rather than basing support needs on a situation's objective characteristics (Cutrona, Cohen, & Igram, 1990).

The Support Adequacy Model

Whereas the optimal matching theory focuses on the match between the dimension of support received and the needs elicited by situational properties, other researchers have emphasised the importance of understanding the amount of support individuals actually want compared to what they receive. Dehle, Larsen, and Landers (2001) classified supportive exchanges in terms of underprovision (receiving less support than wanted), overprovision (receiving more support than wanted), and adequate support (receiving the same amount of support as wanted). Individuals receiving less support than they wanted from a partner reported worse marital relationships, more depressive symptoms, and considered their life situations as more uncontrollable, even after adjusting for social desirability (Dehle et al., 2001).

The effects of adequate support in general psychology. When people receive more adequate support, they are more likely to have better well-being, including better marital satisfaction (Brock & Lawrence, 2008; Lawrence et al., 2008), lower anxiety and depression (Brock et al., 2014; Linden & Vodermaier, 2012), enhanced positive feelings with the relationship (Bar-Kalifa & Rafaeli, 2013), reduced depressive symptoms in bipolar disorder (Koenders et al., 2015), and improved mental health (Melrose, Brown, & Wood, 2015). Furthermore, Priem and Solomon (2015) found that the support adequacy model may have relevance for physiological outcomes such as a decrease in salivary cortisol levels. Specifically, individuals' physiological stress recovery was faster when they appraised the amount

of received support as meeting the level that they wanted (Priem & Solomon, 2015).

The effects of inadequate support in general psychology. Discrepancies between wanted and received support have been associated with worse relationship satisfaction and affect (Joseph, Afifi, & Denes, 2016), difficulty adjusting to university life (Jou & Fukada, 1995, 1996), worse marital quality (Li & Fung, 2012), more positive appraisal (Matsunaga, 2011), and lower self-esteem (Ślebarska, Moser, & Gunnesch-Luca, 2009). Brock and Lawrence (2009), however, argued that inadequate support should not be considered as a unified construct, as receiving more or less support than individuals wanted might bring different effects on well-being.

Underprovision. Underprovision of support has been found to be universally detrimental to health and well-being, with links to increased mortality risks (Thong, Kaptein, Krediet, Boeschoten, & Dekker, 2007), more depression, anxiety, and psychosomatic symptoms (Brown, Brady, Lent, Wolfert, & Hall, 1987), poorer marital satisfaction (Brock & Lawrence, 2009; Dehle et al., 2001), lower satisfaction with life (Denkers, 1999), less positive appraisals for victims' post-bullying adjustment (Matsunaga, 2011), more postnatal depressive symptoms (Gremigni, Mariani, Marracino, Tranquilli, & Turi, 2011), increased positive affect and decreased negative affect (Seiger & Wiese, 2011), lower self-esteem (Waggener & Galassi, 1993), anxiety and depressive disorders (Linden & Vodermaier, 2012), worse physical and mental health (Wolff, Schmiedek, Brose, & Lindenberger, 2013), negative affect and perceived stress (Siewert, Antoniw, Kubiak, & Weber, 2011), and poorer affective and relational outcomes (Bar-Kalifa & Rafaeli, 2013). Previous research has also shown that the harmful effects of underprovision generalise across different contexts and populations, including patients with physical disease (Linden & Vodermaier, 2012; Thong et al., 2007), couples (Bar-Kalifa & Rafaeli, 2013; Brock & Lawrence,

2009; Dehle et al., 2001; Waggener & Galassi, 1993), postpartum women (Gremigni et al., 2011; Seiger & Wiese, 2011), victims of crimes (Denkers, 1999), university students (Brown et al., 1987; Matsunaga, 2011; Siewert et al., 2011), and elderly people (Wolff et al., 2013).

Even though most research has suggested that perceived support is more predictive of well-being than received support (Feeney & Collins, 2014; Uchino, 2009), Siewert et al. (2011) found that receiving less support than individuals want was a more important predictor, because underprovision of support was associated with worse mental well-being, but perceptions of support availability was unrelated to the outcomes. Previous medical research has found that when supportive behaviours are not enough to meet patients' or their caregivers' needs (i.e., the term *unmet needs*), they can experience a number of negative health and well-being outcomes, including high levels of impairment (Lima & Allen, 2001), less satisfaction and high burden (Hwang et al., 2003), greater anxiety (Perz, Ussher, Butow, & Wain, 2011), more stressful life experience (Farrelly et al., 2013), poorer physical health (Girgis et al., 2013), higher depression and anxiety (Lambert, Girgis, Lecathelinais, & Stacey, 2013), lost control of their emotional management about prognosis (Butow et al., 2014), and lower levels of life satisfaction, and higher levels of loneliness and perceived stress (Kadowaki, Wister, & Chappell, 2015). Furthermore, researchers have found that when individuals do not receive enough support, their health and well-being is worse than those who receive support that meets their needs (e.g., Kadowaki et al., 2015), and those receiving no support (e.g., Lima & Allen, 2001).

Overprovision. There are contradictory findings concerning the overprovision of support. Despite evidence that support overprovision can be less beneficial or ineffective for well-being (Bar-Kalifa & Rafaeli, 2013; Coffman, Levitt, & Brown,

1994; Huang, 2012; Siewert et al., 2011; Wolff et al., 2013; Yragui, Mankowski, Perrin, & Glass, 2012), some researchers have found that overprovision of support can actually be harmful, such as leading to decreased positive affect (Silverstein, Chen, & Heller, 1996), dissatisfaction with relationships (Brock & Lawrence, 2009) and poor psychosocial adjustment (Reynolds & Perrin, 2004). Further, studies have demonstrated that receiving excessive amounts of support (even though researchers did not use the term "*overprovision*") is associated with negative outcomes such as threatened autonomy and self-worth among chronically ill individuals (Revenson, Wollman, & Felton, 1983), depressive symptoms (Penninx et al., 1997), less adherence to medical treatment (DiMatteo, 2004), problematic feelings (Boutin-Foster, 2005), and neglect of disease and disease-related life (Kostova, Caiata-Zufferey, & Schulz, 2014).

Reynolds and Perrin (2004) suggested that negative effects of overprovision of support might arise because support providers become emotionally overinvolved or overprotective. Overprotection is a way of providing support, and refers to behaviours that underestimate the recipient's abilities, leading to unneeded help, excessive praise, or excessive regulation for activities (Coyne & Smith, 1991; Hagedoorn et al., 2000; Vilchinsky et al., 2011). Indeed. perceived overprotection has been linked to poorer mental health and life quality (Clarke, Walker, & Cuddy, 1996; Joekes, Van Elderen, & Schreurs, 2007), lower self-efficacy in dealing with disease (Berkhuysen, Nieuwland, Buunk, Sanderman, & Rispens, 1999), poorer marital satisfaction (Hagedoorn et al., 2000), less feelings of control over life (Kuijer et al., 2000), reduced recovery from disease (Vilchinsky et al., 2011), worse dietary adherence (Johnson et al., 2014), and higher levels of depression and anxiety (Cimarolli, 2006). In contrast, some studies have found no significant relationship between perceived

overprotection and psychological distress (Coyne & Smith, 1994; De Ridder, Schreurs, & Kuijer, 2005).

Support (in)adequacy in sport psychology. Limited research has examined the match between wanted and received support in sporting contexts, but some indirect evidence exists. Parental involvement plays an important role in youth sports setting and influence youth athletes' well-being and performance (Anderson, Funk, Elliott, & Smith, 2003; Holt, Tamminen, Black, Sehn, & Wall, 2008; Wuerth, Lee, & Alfermann, 2004). According to Hellstedt (1987), parental involvement can be divided into under, moderate, and over involvement, which has been categorised in a similar manner to support (in)adequacy. Underinvolvement is similar to the underprovision of support, in that parents are not sufficiently involved in their children's sport career. Moderate involvement (adequate support), may be the optimal level of involvement, enabling children to make decisions about sport with some input and support from their parents. Overinvolvement is similar to overprovision of support, which is when parents offer excessive support that their children may not need or want. Some empirical evidence has shown that youth athletes who evaluate their parents as being moderately involved experience better well-being, such as improved enjoyment and reduced stress, whereas those who perceive underinvolvement or overinvolvement report worse well-being (e.g., Stein, Raedeke, & Glenn, 1999). Indeed, although parents have encouraged to be more involved in their children's sport career, parental overinvolvement can be problematic (e.g., Fredricks & Eccles, 2004; Gould, Lauer, Rolo, Jannes, & Pennisi, 2006). Parents who are overinvolved are more likely to highlight triumph, be upset if their children do not play well, and even hinder the coach's instructions (Hellstedt, 1987). Further, parental overinvolvement may increase stress in youth athletes because their parents expect

them to be successful (Wolfenden & Holt, 2005). Similarly, overinvolved parents are often perceived by coaches as pushy, controlling, demanding, overbearing, and performance-oriented, which negatively influence coaching process (Gould, Lauer, Rolo, Jannes, & Pennisi, 2008). Parental overinvolvement, therefore, can be detrimental to young athletes, including unfavourable effects on sporting experience and participation (Kamm, 1998), increased burnout (Gould, Tuffey, Udry, & Loehr, 1996), and heightened anxiety (Salla & Michel, 2014).

Measurement of support (in)adequacy. Studies have differed in how they have measured the (in)adequacy of support: 1) a difference score, by subtracting the amount of support individuals wanted from the actual amount of support they received, with a score of 0 representing adequate support (e.g., Dehle et al., 2001); 2) an interaction score, by examining the effects of a product term created from wanted and received support on outcomes (e.g., Silverstein et al., 1996); 3) a division score, by dividing the frequency of support individuals received by that which they wanted, with a score of 1 representing adequate support (e.g., Melrose et al., 2015); 4) a perceived adequacy score, by asking individuals to evaluate how much support they would like to have received compared to what they actually received (*less, the same, or more*), perceived the same amount of support means the adequate support (e.g., Brock & Lawrence, 2008).

Difference score. Brown et al. (1987) developed the Social Support Inventory (SSI) which focused on the person-environment and subtracted received support from needed support, with greater difference scores representing a poorer support fit. This was the first study to examine social support (in)adequacy and found that a greater discrepancy between needed and received support predicted more depression, anxiety, and psychosomatic symptoms (Brown et al., 1987). A number of studies have

subsequently examined social support (in)adequacy by this or similar difference score methods, and have found links with positive affect (Barden, Barry, Khalifian, & Bates, 2016), negative affect and health status (Wolff et al., 2013), affect and relationship satisfaction (Joseph et al., 2016), marital quality (Dehle et al., 2001; Li & Fung, 2012), negative affect and stress (Siewert et al., 2011), support quality (High & Steuber, 2014), and job search behaviours and self-esteem (Ślebarska et al., 2009).

Limitations of difference scores. Even though a difference score method has been widely used in the social support literature (e.g., Dehle et al., 2001), this methodological approach has been questioned in the general psychology literature (Edwards, 1994, 2001). One of the most prevalent problems with difference scores is low internal consistency reliability (e.g., Cordes, Dougherty, & Blum, 1999). Edwards (2001) argued that in most psychology research, the difference score is less reliable than investigating the component variables jointly, if these variables are positively correlated. Fewer researchers have questioned the reliability of difference scores in the social support literature, but most studies have reported the reliabilities of wanted and received support rather than the difference score itself (e.g., Faw, Harvey, & Feng, 2018; Matsunaga, 2011). Some studies have, however, found that the reliability of the difference score of wanted and received support was lower than the reliability of received support (e.g., Ślebarska et al., 2009). A further problem is that a difference score may confound the effects of the two components, and therefore reduce effect sizes and explained variances (Cafri, van den Berg, & Brannick, 2010; Edwards, 2001, 2002).

Bar-Kalifa and Rafaeli (2013) highlighted a further limitation of difference scores in the social support literature. That is, a difference score of zero is typically labelled as adequate support (e.g., Dehle et al., 2001), but it is unknown if the effects

on outcomes of congruent wanted and received support at low levels (i.e., low wanted and low received) is equivalent to congruence at higher levels. Therefore, Bar-Kalifa and Rafaeli (2013) defined a 'baseline state' as no wanted support and no received support, and found that this was less favourable to the well-being than congruence between wanted and received support at higher levels of those variables (termed an 'optimal state'). This categorical method holds promise, but the comparison of different levels of adequate support (e.g., low wanted and low received versus high wanted and high received) warrants further investigation.

Another area of debate in terms of difference scores and the support adequacy hypothesis has been whether difference scores should be used as raw values such as overprovision and underprovision, or absolute values such as inadequate support (High & Steuber, 2014; Joseph et al., 2016; Matsunaga, 2011). Studies employing absolute values (e.g., High & Steuber, 2014; Joseph et al., 2016; Matsunaga, 2011) were more interested in the effects of the discrepancy between wanted and received support on the outcomes rather than the direction of that discrepancy, and often found that the absolute difference score was more predictive of outcomes than the raw difference score. The researchers argued that whether individuals' desires for support are matched is more crucial than whether individuals receive more or less support than they wanted, because both underprovision (e.g., Dehle et al., 2001) and overprovision (e.g., Wolff et al., 2013) have been associated with poor well-being, such as depression, stress, and negative affect. Indeed, receiving more support may cause individuals to feel dissatisfaction and disappointed (Cutrona, 1996), and therefore experience poorer well-being. However, this interpretation cannot explain the beneficial (e.g., Siewert et al., 2011) or null effects (e.g., Bar-Kalifa & Rafaeli, 2013) of overprovision on outcomes. Further, the apparent weaker effects of raw

values compared to absolute values may be due to nonlinear effects of raw difference scores on outcomes (Joseph et al., 2016; Matsunaga, 2011). Interestingly, Brock and Lawrence (2009) asserted that inadequate support should be examined as theoretically different forms because although underprovision and overprovision of support were both harmful to marital satisfaction, overprovision was a greater risk factor than underprovision.

Interactions. Some researchers have explored whether a product term of wanted and received support predicts outcomes (Searle, Bright, & Bochner, 1999, 2001; Silverstein et al., 1996). Indeed, in congruence research in general psychology, this approach has been generally applied in order to avoid the issues with difference scores (See review by Edwards, 2001). Although some studies found that an interaction score between wanted and received support did not predict anxiety (Munir & Jackson, 1997) and depression, somatic complaints, and happiness (Jou & Fukada, 1997), other research has found it did predict perceived stress (Searle et al., 1999), task performance (Searle et al., 2001), positive mood (Silverstein et al., 1996), and anxiety and depressive symptoms (Linden & Vodermaier, 2012). To explore the interaction, post-hoc analyses were typically conducted to investigate how the wanted support and received support interaction was associated with well-being. Searle et al. (1999) found that individuals who wanted support but did not receive high levels of support in a work environment reported more pressures and assessed their performance more negatively. Searle et al. (2001) replicated the experiment and found that individuals who wanted low levels of emotional support performed more accurately if they received low emotional support than those who received high support. Also, individuals who wanted high emotional support performed more accurately if they received high emotional support than those who received low

support. Linden and Vodermaier (2012) tested a match-mismatch model (i.e., low wanted, low received support; low wanted, high received support; high wanted, low received support; high wanted, high received support) upon mental distress in questionnaire research with cancer patients and healthy adults. For the cancer patients, when individuals wanted high levels of support but received low levels, their anxiety and depression was worse than individuals who received high levels of support. In the sample of healthy adults, a similar pattern was found for anxiety but not depression (Linden & Vodermaier, 2012). Silverstein et al. (1996), however, reported a nonlinear model in which elderly parents who wanted low levels of support from their children initially reported greater positive mood when they received more support than they expected, but when received support exceeded moderate levels positive mood sharply declined. For elderly parents who wanted high support but received low support, their well-being was not worse than those people who received adequate support. This finding, therefore, suggests that overprovision of support could be more harmful for well-being than underprovision (Silverstein et al., 1996).

Limitations of interactions. Even though previous research employed a product term instead of difference scores (e.g., Deluga, 1998), Edwards (2001) argued that the only viable use of a product term as an alternative to difference scores was when the two component variables are dichotomous. For continuous measures, a product term cannot substitute for difference scores to demonstrate the effects of congruence, because the product term shows a nonlinear relationship with the outcome when the two component variables are equivalent, and the difference score only showed a linear relationship with the outcome when one variable was discrepant to another (see Edwards, 2001). Therefore, previous researchers (e.g., Tinsley, 2000) suggested that a more appropriate analysis for the effects of congruence should

include both difference score and product term.

Division. Most recent literature has applied different approaches of division method to examine whether the proportion of received support to wanted support (i.e., the proportion of receiving more, less, or the same support than wanted) is associated with outcomes (e.g., Brock & Lawrence, 2009; Melrose et al., 2015; Yragui et al., 2012). The division method has varied across studies. For example, Brock and Lawrence (2009) asked participants to rate the frequencies of receiving specific supportive behaviours in the last month, and then evaluated their preference for each support (more or less). The proportion of underprovision was represented by dividing the overall supportive behaviours (i.e., 48 items) by the number of items for which individuals preferred more support, whereas the overprovision proportion was represented by dividing the overall supportive behaviours (i.e., 48 items) by the number of items for which individuals preferred less support. More specifically, if an individual reported that he/she wanted 10 more support behaviours than received (i.e., underprovision) and wanted 20 less support behaviours than received (i.e., overprovision), then the underprovision proportion of this person would be .21 (10 divided by 48 overall supportive behaviours) and the overprovision score would be .42 (20 divided by 48). Both underprovision and overprovision were found to be negatively associated with satisfaction with marriage, and interestingly, overprovision was an even worse risk factor for the wellbeing than underprovision (Brock & Lawrence, 2009).

Yragui et al. (2012) used the term positive congruent support to represent adequate support, by dividing the number of support items wanted and received by the number of support items wanted; the term support commission represented overprovision, and involved dividing the number of support items not wanted and

received by the number of support items not wanted. The findings indicated that higher adequate support was associated with more favourable job-related outcomes, such as increased job satisfaction, decreased job reprimands and job termination, while overprovision did not predict these job-related outcomes (Yragui et al., 2012). Similarly, Melrose et al. (2015) measured the amount of individuals' wanted and received support in the last month, and then divided the received support by wanted support; a score of 1 represented adequate support (received support equalled wanted support). The proportion of received to wanted support was found to be positively associated with satisfaction with support and mental health (Melrose et al., 2015).

Limitations of division scores. There are still some methodological problems with division methods. For instance, in the Study 1 of Melrose et al. (2015), the division method cannot be used with participants who do not want any support, as the denominator cannot be 0. Hence, Melrose et al. (2015) excluded 27 participants who indicated that they did not want support, which could impact upon reliability and validity. Another limitation is that a division score is a highly nonlinear score and may be inappropriate for general linear models such as linear regression analysis. That is, if the frequency of wanted support is 1, then an increase in received support from 1 to 10 would result in a proportion change from 1 to 10. However, if an individual reported their wanted support as 10, then an increase in received support from 1 to 10 would generate a change in the proportion from 0.1 to 1. Furthermore, previous research has not examined the whole picture of support adequacy model by using division scores, for example, Brock and Lawrence (2009) only examined overprovision and underprovision, Melrose et al. (2015) only examined adequate support, and Yragui et al. (2012) only examined adequate support (i.e., positive congruent support) and overprovision (i.e., support commission).

Perceptions of support (in)adequacy state. Apart from the different types of calculation methods (i.e., difference score, product terms, and division), some researchers have measured the individuals' perceived support (in)adequacy (Brock et al., 2014; Coffman et al., 1994; Gottlieb, Maitland, & Brown, 2014; Gremigni et al., 2011; Huang, 2012; Melrose et al., 2015; Priem & Solomon, 2015; Seiger & Wiese, 2011; Young & Perrewé, 2000). More specifically, when individuals perceived that they received the same amount of support that they wanted (i.e., adequate support), they experienced lower depression (Brock et al., 2014), reduced depressive symptoms in bipolar disorder (Koenders et al., 2015), increased marital satisfaction (Brock & Lawrence, 2008), improved mental health (Gottlieb et al., 2014; Melrose et al., 2015, Study 2), faster salivary cortisol recovery (Priem & Solomon, 2015), and better relationship effectiveness and trust (Young & Perrewé, 2000). Individuals' perceptions of not receiving enough support (i.e., underprovision) has been found to be universally associated with poor health and well-being, such as greater depressive symptoms (Choi & McDougall, 2009; Gremigni et al., 2011), increased negative affect (Seiger & Wiese, 2011) and increased mortality risks (Thong et al., 2007). Unlike the mixed effects of overprovision found with other methods (e.g., Brock & Lawrence, 2009; Siewert et al., 2011), perceived overprovision of support has generally been related to favourable outcomes, including more positive relationship satisfaction, emotional affect and parenting attitudes (Coffman et al., 1994), and better life satisfaction (Huang, 2012).

Limitations of perceived (in)adequacy. According to Edwards (2001), directly measuring comparisons of two components instead of measuring them separately can have some issues, such as requiring participants to mentally calculate the difference or subjectively evaluate (in)adequacy. Indeed, a recent study (Faw et al., 2018)

adopted a difference score of received support minus wanted support as a predictor, and the perception of support adequacy as the outcome variable. The study found that receiving more support than wanted (i.e., overprovision) was associated with more perceived support adequacy instead of a difference score of zero (i.e., adequate support; Faw et al., 2018).

Moreover, measuring subjective evaluations of support (in)adequacy may represent a more qualitative perspective than quantitative (Raveis, Karus, & Pretter, 2000; Thompson, McBride, Hosford, & Halaas, 2016; Viinamäki, Koskela, Niskanen, & Arnkill, 1993). Also, some studies using this approach have focused on perceptions of available support rather than received support over a specific time period (Bloor, Sandler, Martin, Uchino, & Kinney, 2006; Chipperfield, 1996; McIntosh, 1991; Oxman, Berkman, Kasl, Freeman, & Barrett, 1992; Seeman & Berkman, 1988; Sykes & Eden, 1985). Researchers should be cautious when citing such studies in relation to the support adequacy model as findings relating to perceived support may not extend to received support and vice versa.

Factors that Influence the Effects of (In)adequate Support

Cultural differences. Most investigations into the effects of social support have been conducted in Western populations, but the importance of social support in Eastern cultures has also been highlighted (Kim, Sherman, & Taylor, 2008). Studies examining cultural differences in social support have found that compared to Western populations, Eastern populations report less frequent use of social support (Taylor et al., 2004; Wang, Shih, Hu, Louie, & Lau, 2010) and perceive support to be less effective (Kim, Sherman, Ko, & Taylor, 2006; Wang et al., 2010). According to Kim et al. (2008), Western populations typically have more individualistic cultures in which people view themselves and relationships in a more independent manner,

therefore, they may consider desiring and receiving support as free behaviours with fewer social obligations; in contrast, Eastern populations typically have collectivistic cultures in which people view themselves and relationships in a more interdependent manner, and may consider group beliefs and goals as more important than the personal ones, therefore, they would be more cautious about troubling others with their own problems, as they may consider desiring and receiving support would become burdens of their social networks. For example, Taylor et al. (2004) conducted three cross-sectional questionnaire-based studies to examine the cultural difference of using social support between Asian university students and European American university students. Taylor et al. (2004) found a consistent pattern that Asian students reported using less social support than European American students for solving different stressful life events (Study 1), for overcoming the same stressor (Study 2), and furthermore, this cultural difference was attributed to different relationship norms when using social support in that Asians were more likely to be concerned about the relational outcomes, such as ruining the group harmony and receiving criticism (Study 3). The similar phenomena was also observed in the experimental studies (e.g., Kim et al., 2006). Further, Wang et al. (2010) conducted a 10-day daily diary study and reported a similar pattern of findings to Taylor et al. (2004) with Asian American students using social support less frequently than European American students not only in negative life events, but also in positive life events. Moreover, Asian Americans perceived the receipt of support as less effective than European Americans (Wang et al., 2010).

Cultural difference of support (in)adequacy. Previous research examining the support (in)adequacy model has mainly explored Western cultures, but studies (Faw et al., 2018; Xu & Burleson, 2001) have found that Eastern populations (i.e.,

Chinese) want and receive different amounts of social support compared to Western populations (i.e., American). Americans received more emotional support from their partners than did Chinese; whereas Chinese received more informational support from their partners than did Americans, and Chinese wanted more network and informational support from their partners than did Americans (Xu & Burleson, 2001). Therefore, it is important to investigate whether the effects of support (in)adequacy on well-being also generalise to Eastern cultures. There is some limited evidence that partially supports the support (in)adequacy model among Eastern samples. For example, Chinese samples who received more discrepant (inadequate) support based on an absolute difference score have been found to experience worse well-being, including poorer marital quality (Li & Fung, 2012) and difficulty settling into university life (Jou & Fukada, 1995, 1996). Specifically, Li and Fung (2012) examined the impact of discrepancies between wanted and received support on marriage quality among 56 couples with ages from 20 to 79 years old. The husbands' support discrepancy, but not wives', were found to be associated with worse marriage quality (Li & Fung, 2012). Furthermore, perceptions of overprovision predicted greater life satisfaction among elderly Chinese who lived in rural areas, but not among elderly city residents (Huang, 2012). No studies have investigated underprovision and adequate support among Eastern populations, therefore, more studies are needed to examine support (in)adequacy model in the Eastern contexts.

Requested support. One key recipient-related factor that may also influence the effectiveness of (in)adequate support and received support more generally is whether support is actually requested (Bolger & Amarel, 2007). Researchers (Barrera, 1986; Song & Chen, 2014) have emphasised a distinction between requested and unrequested support (i.e., whether recipients or providers initiate the support

exchange), and this can influence the impact of support on well-being. Nadler, Fisher, and colleagues (e.g., Fisher et al., 1982; Nadler & Fisher, 1986) explained requested support behaviours in a threat-to-self-esteem model. In general, when social support was threatening to the self-esteem, individuals were unwilling to request or receive further support. Whereas when support was more effective, individuals were more willing to request and receive it. Horowitz et al. (2001) proposed a goal-matching model that suggested individuals requesting support often have goals (i.e., want specific help and support), and that satisfaction with support is increased when the support received meets these goals. Moreover, evidence suggests that recipients rate providers as more sensitive when the support that they receive matches their goals, while the relational outcomes between recipients and providers became worse if the recipients' goals are not met (Cutrona, Shaffer, Wesner, & Gardner, 2007). As such, researchers (e.g., Bolger & Amarel, 2007; Thoits, 1995) have highlighted the importance of examining the effects of (un)requested support, but studies remain scarce and the limited empirical evidence is inconsistent.

Beneficial effects associated with requested support. Requesting support can be an essential step in initiating supportive exchanges from a recipient's perspective (Cutrona, 1996). Requesting support is often considered as an adaptive coping strategy, in order to help individuals to cope with distress when they faced stressful situations (Thoits, 1986, 2011). For instance, lung cancer patients had less depressive symptoms if they more frequently requested social support (Walker, Zona, & Fisher, 2006). According to Bolger and Amarel (2007), received support may be more effective if the recipients have decided to request support rather than receiving the unsolicited support. If individuals have already assessed themselves as unable to cope with a problematic situation and therefore request support, then that supportive

interaction may not lead to feelings of incompetence and other mental distress (Bolger & Amarel, 2007).

Negative effects associated with requested support. Even though requesting and subsequently receiving support may be beneficial for individuals' well-being (e.g., Bolger & Amarel, 2007), some people are unwilling to request support for a number of reasons. For example, individuals may worry about troubling others and being embarrassed when asking for help, or feel that requesting support undermines their own self-esteem (Mattson & Hall, 2011). Asking for support can also expose one's problems to others' attention and judgement, thus potentially leading to feelings of over-dependency, inferiority, and inadequacy (Fisher, Goff, Nadler, & Chinsky, 1988). Moreover, following a request for support, received support may be linked to detrimental effects if support providers aid recipients in a grudging or inappropriate manner (Coyne et al., 1988). Likewise, individuals explicitly requesting support may trigger providers' expectations of repayment, which often erodes any potential beneficial effects of supportive behaviours (Steinberg & Gottlieb, 1994). Finally, requested support has been associated with worse mental and physical health, particularly when individuals receive less support than they request (Jou & Fukada, 2002). This effect may be similar to the harmful effects of underprovision of support (receiving less support than wanted), but wanted and requested support are unique constructs as individuals may not always request support even if they really want it.

Unrequested support. Social support often occurs within a well-functioning social network without an explicit request for help (Eckenrode & Wethington, 1990). Indeed, several studies have investigated the prevalence of support received without a request. For example, in a sample of European and American young adults, Chentsova Dutton (2012) found that approximately half of the support received from

family and friends was unsolicited. Similarly, Smith and Goodnow (1999) reported that a sample of German people received 35 different forms of unrequested support during daily life events.

Beneficial effects associated with unrequested support. Some researchers have argued that unrequested support may be beneficial for mental and physical health (e.g., Eckenrode & Wethington, 1990). Receiving support without a request can help to preserve recipients' self-esteem and bolster intimacy and dependability with their providers (Eckenrode & Wethington, 1990). Thoits (2011) also proposed that receiving unrequested support may enhance the perception of availability of support, and this perception would be beneficial for people's future life events. Further, Morling, Uchida, and Frentrup (2015) found that when European American students received unrequested support (versus with requested support), they experienced more positive affect and competence. Mojaverian and Kim (2013) however, found that requesting support or not did not influence the effectiveness of received support in European American students attempting mathematical tasks, but Asian American students who received unrequested advice (i.e., informational support) experienced improved self-esteem, lower perceived stress, and more positive moods.

Negative effects associated with unrequested support. In contrast, Goldsmith and Fitch (1997) argued that unrequested support may be seen as interfering, and undermine feelings of self-worth and autonomy. A questionnaire-based study found that unrequested support was perceived as unpleasant through increasing the feelings of incompetence (Smith & Goodnow, 1999). Song and Chen (2014) found that the receipt of unrequested job advice elicited more depression among American working-age individuals. Song (2014) replicated this finding in Chinese adults, who

experienced worse mental health when they received unrequested job advice. There is some experimental evidence that has also indicated that unrequested support can exert deleterious effects (e.g., Deelstra et al., 2003). Deelstra and colleagues found that individuals who received unrequested support experienced poorer psychological outcomes (i.e., higher negative affect and lower competence-based self-esteem) and worse physiological outcomes (i.e., stronger increase in heart rate and decrease in respiratory sinus arrhythmia), compared with individuals who received no support.

Factors that influence the effects of (un)requested support. According to Maisel and Gable (2009), the effects of receiving unrequested support may be contingent on whether support is responsive to recipients' needs. Further, Kappes and Shrout (2011) found that support providers offered more unrequested support when they had personal goals for the recipients, and that the higher amount of unrequested support resulted in more negative outcomes, particularly among the recipients who did not have the same goals themselves.

Deelstra and colleagues (2003) found that the receipt of unrequested support was associated with less harmful effects for recipients who needed the support to complete a task that they could not perform without external assistance. Similarly, Song and Chen (2014) found that for individuals with a greater need for job advice (i.e., informational support), the receipt of unrequested support was associated with lower depression; for those with a lower need for job advice, the receipt of unrequested support was associated with more depression. However, these studies generally based support needs on situational properties rather than the individuals' own perceptions of what they wanted. For example, an unsolvable situation was used as a high need for support, and solvable situation was used as low need for support (Deelstra et al., 2003). Similarly, Song and Chen (2014) measured high or low need

for support by the situation, specifically whether unemployed adults were experiencing financial problems. However, Morling and colleagues (2015) argued that unrequested support is beneficial rather than harmful when individuals perceive the support as repayable and given freely by providers. Requested support was associated with better mental well-being (i.e., competence, autonomy, and relatedness), and this effect was particularly strong if individuals who felt support was particularly needed. Therefore, empirical evidence has shown different factors may influence the effectiveness of received (un)requested support, but it appears that whether individuals actually want support is one of the most important factors.

Requested and unrequested support in sport psychology. The impact of requested support versus unrequested support has received little attention in sport contexts, but athletes may frequently experience unsolicited help, such as when a coach provides instructions (Rees & Freeman, 2012). Further, even though some studies have found that social support is beneficial for athletes, some researchers have argued that athletes avoid asking for support as they don't want their support providers (e.g., coach) to perceive them incompetent (Pensgaard & Roberts, 2003). In contrast, a qualitative study showed that elite British student-athletes viewed requesting support as an effective coping method during transitional periods (Brown et al., 2015). No studies in sport though have investigated if the effects of received support are contingent on whether athletes have requested it. As such, a key issue for research is to examine the relationship between receiving requested (versus unrequested) support and sport-related outcomes.

Satisfaction with support. Lakey and Heller (1988) stated that support satisfaction is important and underpins the effectiveness of support. Indeed, some researchers have suggested that the subjective assessments of support such as

satisfaction may be better predictors of health compared to quantitative measures of supportive behaviours (Antonucci, 1985; Barrera, 1986). Indeed, Fiorillo and Sabatini (2011) found that, compared to frequency of interactions, subjective satisfaction with support was a more important determinant of individuals' health.

Satisfaction with support is characterised as a perceptual process, and reflects the extent to which recipients perceive that the support received met their needs (Brown et al., 1987). Brown and colleagues (1987) suggested that difference scores represent an objective form of congruence between wanted and received support, whereas satisfaction with support is its subjective form. Theoretically, if recipients receive less support than they wanted and/or requested, their support satisfaction will be lower; in contrast, if they receive comparable or higher levels of support than expected, satisfaction with support will be greater (Cutrona, 1996; Dunkel-Schetter & Bennett, 1990). High and Steuber (2014) found that for those individuals who reported underprovision of support (i.e., they received less support than they wanted), they reported lower satisfaction with support.

Support satisfaction in general psychology. Satisfaction with support has been associated with better well-being in various contexts including decreased postnatal depression (Beck, 2001; Sheng, Le, & Perry, 2010), better self-reported physical and mental health in aging populations (Krause, 1987; Krause, Liang, & Yatomi, 1989), less acculturative stress in international students (Yeh & Inose, 2003), reduced anxiety in college students (Felsten & Wilcox, 1992), and improved quality of life in patients with cardiovascular disease (White-Williams et al., 2013).

Support satisfaction in sport psychology. Satisfaction with social support appears to be an important construct in sports context. Bianco (2001) found that injured elite skiers were less satisfied with their coaches' support when they expected

more support than they received. The skiers were more satisfied with their support when the coaches' supportive behaviours met or surpassed the support they wanted. Support satisfaction has also been linked with other favourable outcomes among athletes, including reduced anxiety and depression for injured athletes when they returned to competitions (Covassin et al., 2014; Yang et al., 2014), enhanced athlete-coach relationship and training atmospheres (e.g., perceived more closeness and positive feedback from coaches) (Alfermann, Geisler, & Okade, 2013), more self-determined motivation (DeFreese & Smith, 2013), lower burnout and greater life satisfaction (DeFreese & Smith, 2014), less mood disturbance (Albinson & Petrie, 2003), more flow experience in sport (Schüler, Wegner, & Knechtle, 2014), lowered perceived stress and burnout (Raedeke & Smith, 2004), enhanced team identification and cohesion (De Backer et al., 2011), basic psychological needs (i.e., perceptions of autonomy, relatedness, and competence) (Adie, Duda, & Ntoumanis, 2008), and improved positive moods and better feelings of the sports experience (Blanchard, Amiot, Perreault, Vallerand, & Provencher, 2009).

Aims and Hypothesis

In light of the preceding literature review, the overall aim of this thesis was to advance understanding into the impact of received support in sport. Table 1 summarises the rationale, aim, and method of each of the chapters that follow.

Table 1
The rationale, aim, and method of each Chapter

Chapter	Rationale	Aim	Method
2a	• No study has examined support (in)adequacy model in sport. • There has been limited experimental tests of the support (in)adequacy model. • Limited research has examined the effects of support (in)adequacy on objective performance outcomes.	• To investigate whether support (in)adequacy influences sport performance and psychological well-being	Experiment
2b	• In addition to the above (2a), it may be important to control for baseline levels of performance and psychological well-being.	• To investigate whether support (in)adequacy influences changes in sport performance and psychological well-being	Experiment
3	• Previous statistical approaches to examine support (in)adequacy may be limited. • Limited research has examined the effects of support (in)adequacy across different cultures.	• To investigate whether support (in)adequacy influences psychological well-being and whether these effects operate indirectly via satisfaction with support using polynomial regression analyses. • To examine if the effects of support in(adequacy) are consistent across British and Chinese athletes.	Cross-sectional questionnaires
4	• Evidence for the effects of overprovision of support on outcomes is mixed. • Limited research has examined the combined effects of wanted, requested and received support on outcomes.	• To explore whether requesting support further impacts upon the influence of wanted and received support on psychological well-being, and whether these effects operate indirectly via satisfaction with support using polynomial regression analyses.	Questionnaires at two-time points

Chapter 2: The Influence of (In)adequacy of Wanted and Received Support on Performance Outcomes: Two Experimental Studies

Introduction

Beneficial associations have been found between social support and sport-related outcomes, such as burnout (Raedeke & Smith, 2004), self-confidence (Rees & Freeman, 2007), positive and negative affect (Freeman et al., 2014) and performance (Rees & Freeman, 2010). In light of these findings, social support is a key resource for athletes. Despite this evidence, the receipt of social support is not universally beneficial (DeFreese & Smith, 2013; Yang et al., 2014). To develop a more comprehensive understanding of social support in sports contexts, it is vital to provide greater insight into the amount of support that athletes want and whether this influences the effectiveness of received support. This chapter therefore reports two studies that investigated the influence of wanted and received social support in sport. Social support has been classified into structural and functional components (Cohen et al., 2000; Vangelisti, 2009). Structural components are the number and/or interconnectedness of individuals' social relationships. Functional components are the supportive behaviours and messages that those relationships may provide, and can be divided into two types: perceived support and received support. *Perceived support* is people's perceptions that support will be available in times of need (Lakey, 2010). *Received support* refers to the actual supportive behaviours and messages provided by other people during a specific time period (Lakey, 2010). In contrast to the diverse benefits of perceived support found in social psychology (e.g., Lakey & Rhodes, 2015) and sport psychology (e.g., Freeman et al., 2011; for more details, see Chapter 1), received support has been found to be less beneficial, ineffective, or even detrimental for physical and mental health (Feeney & Collins, 2015; Uchino, 2009). In sport psychology, some empirical evidence has revealed beneficial effects of received support upon outcomes, such as self-confidence (Rees & Freeman, 2007),

burnout (Raedeke & Smith, 2004), and performance (Freeman & Rees, 2008). Despite this evidence, not all supportive behaviours are beneficial to athletes, as athletes tend to judge social interactions as more negative than positive (Udry et al., 1997). Indeed, the receipt of social support has been found to not be significantly related to athletes' feelings of depression, anxiety, and burnout (DeFreese & Smith, 2013; Yang et al., 2014). Moreover, athletes who received high levels of support experienced more negative affect than those who received low support under non-stressful environments (Freeman et al., 2014).

One important recipient-related factor proposed by the support adequacy model (Dehle et al., 2001) is the level of support individuals actually want. Received support is suggested to only be effective if it matches the level of wanted support. Specifically, the support adequacy model classified the (in)congruence between wanted and received support into three concepts: *underprovision* (recipients receive less support than wanted), *adequate support* (recipients receive the same amount of support as wanted), and *overprovision* (recipients receive more support than wanted). Receiving adequate support has been found to be associated with better well-being (e.g., Siewert et al., 2011), whereas a mismatch between the support individuals wanted and received has been found to be associated with worse well-being (e.g., Ślebarska et al., 2009). More specifically, underprovision of support has typically been found to be harmful to well-being, such as poorer mood and relationship outcomes (Bar-Kalifa & Rafaeli, 2013). Unlike the consistent effects of adequate support and underprovision, evidence for the effects of overprovision of support is less consistent as it has been related to beneficial effects (e.g., Huang, 2012), null effects (e.g., Bar-Kalifa & Rafaeli, 2013), or even detrimental effects (e.g., Brock & Lawrence, 2009) on outcomes.

Despite the intriguing findings of the support adequacy model, experimental tests of its predictions remain rare. Searle et al. (1999) manipulated a work environment and found that individuals who wanted but did not receive high levels of support (i.e., underprovision) reported more pressures and assessed their performance more negatively. However, evidence of the effects of (in)adequate support on objective performance has been inconsistent. Searle et al. (1999) found that the interaction between wanted and received support did not influence individuals' performance (accuracy and response time of a mail-sorting task). However, Searle et al. (2001) replicated the experiment and found that performance of the mail-sorting task improved if individuals received adequate emotional support. The inconsistent findings suggest that more experimental studies are needed, and moreover, research, has yet to experimentally examine the effects of (in)adequate support in sports contexts.

Given the limited experimental research into the support adequacy model, two studies were conducted to examine its predictions using a golf putting task. It was hypothesised that adequate support would elicit more favourable psychological outcomes and better performance, whereas underprovision would elicit less favourable psychological outcomes and poorer performance. Due to the mixed effects of overprovision in the literature, we did not propose a specific effect for this construct.

Study 1

Method

Participants and Design

Participants were a sample of 88 (35 female, 53 male; M_{age} = 22.2, SD = 3.8 years) students in a British university. The majority of sample was White (68.2%);

Asians accounted for 19.3% of the sample. Participants had competed for 7.2 ± 5.2 years ($M \pm SD$) in various individual (n = 57) and team (n = 31) sports at recreational (n = 45), club (n = 33), regional (n = 5), national (n = 3), or international (n = 2) level. These participants were drawn from an initial sample of 226 (83 female, 143 male; M_{age} = 21.1, SD = 3.4 years) participants who were shown a written description of a modified golf putter and putting task (See Appendix - I), and asked to rate the support they would want if they performed the task. The 44 participants who wanted the most support and the 44 participants who wanted the least support were recruited to the full experiment. All participants reported having either very little experience or no experience of golf-putting. The study had a two-factor between-subjects design, with two levels to each factor (wanted support: high, low; manipulation: support, control).

Materials

The experiment involved a golf-putting task completed in a laboratory. The equipment consisted of: an artificial indoor putting green; a Rhythmiser golf putter (Harold Swash Putting Ltd, Merseyside, UK), which has a highly flexible shaft that increased the difficulty of task; a standard white golf ball (diameter = 4.27 cm); and a digital camera (Canon LEGRIA HF R16) to record the golf-putting task.

Procedure

The study was approved by a university ethics committee and participants provided informed consent. The experimenters were two male postgraduate sports and exercise science students. The first experimenter delivered the general instructions and scored the putting task; the second experimenter was introduced as a golf expert to the participants, and he delivered the support manipulation.

Before entering the laboratory, participants in either the high wanted support group (n=44) or the low wanted support group (n=44) were randomly assigned to an

experimental support condition or a control condition. Therefore, there were 22 participants in each of four conditions: a) low wanted support/received support condition, b) low wanted support/control condition, c) high wanted support/received support condition, and d) high wanted support/control condition. The high and low wanted support groups were established by a third researcher who took no further part in data collection so that the first and second experimenter were blind to whether the participants had previously scored high or low on wanted support. The first experimenter was also blind to whether participants would receive the support manipulation or be in the control condition, and the participants were blind to the purpose of the study.

Participants were instructed from a standardised script that the nature of the study was to understand about task performance using a modified putter under experimental conditions, followed by an explanation of the golf-putting task and its scoring system. To enhance task engagement, all participants received instructions highlighting the importance of the task, that a leaderboard would be emailed to all participants and displayed on a noticeboard, that the task would be recorded on a digital video camera and the video shown in teaching and presentations, that three participants with worst performance would be interviewed, and that cash prizes would be awarded for the top three performers (£30, £20, £10, respectively). Such manipulations are well-established and commonly used throughout stress and anxiety research (e.g., Moore, Wilson, Vine, Coussens, & Freeman, 2013).

In addition to the general instructions, participants in the support condition were provided the following scripted message, adapted from Rees and Freeman (2010):

I fully believe that you will be able to execute this task

successfully. I would view the task as a positive and enjoyable experience. Just relax, take your time, and focus on the target each time you putt. I will be here throughout the task and understand how you might be feeling before this task, so please feel free to ask for my help at any time.

After the support manipulation, participants completed a manipulation check and measures of self-confidence and affect. The task (10 golf-putts) was then performed from 2m to a regular-size hole. Once the participants had completed the task, they were thanked and debriefed about the aims of the study.

Measures

Wanted support. Wanted support was assessed using an adapted version of the Athletes' Received Support Questionnaire (ARSQ; Freeman et al., 2014). Freeman and colleagues demonstrated that the ARSQ had sound psychometric properties. The original ARSQ measures four dimensions of support: emotional, esteem, informational, and tangible. The tangible support subscale (e.g., help with transport to training and competition/matches) was not used in the current study as the items were not relevant for an experimental setting. The generic stem was modified to "Prior to attempting the golf-putting task, would you want someone to …". One informational support item from the original ARSQ was reworded from "give you advice about performing in a competitive situation" to "give you advice about performing the task". The other items were identical to those of ARSQ. In the present study, the 16 items were rated on a dichotomous scale: *no* (0) and *yes* (1) (See Appendix - I). A total wanted support score was calculated by summing responses and higher scores indicate higher levels of wanted support.

Manipulation check. To assess whether participants felt they received

support from the expert golfer, they were asked: “Please indicate, by ticking yes or no, whether the expert did offer you support”. Participants responded on a dichotomous scale: *no* (0) and *yes* (1) (See Appendix - I).

Self-confidence. Self-confidence was assessed by the five-item scale from the Revised Competitive State Anxiety Inventory-2, which has been used to collect data that demonstrates good internal consistency (Cox, Martens, & Russell, 2003). Participants reported how confident they felt about the upcoming golf-putting task on a 4-point scale ranging from 1 (*not at all*) to 4 (*very much so*). Example items included “I feel self-confident” and “I’m confidence because I can mentally picture myself reaching my goal” (See Appendix - I). The mean of the five items was calculated with higher scores indicating greater self-confidence.

Affect. Positive and negative affect were assessed using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS has been employed in various sport-related studies (e.g., Davis & Jowett, 2014; Freeman et al., 2014) and findings have supported its reliability within a sporting context. The PANAS contains two 10-item scales that assess positive affect and negative affect. The positive affect contains items such as “excited” and “strong”, whereas the negative affect scale includes items such as “upset” and “scared”. Participants were asked to report the extent to which they were currently feeling each item on a 5-point scale ranging from 1 (*not at all*) to 5 (*extremely*) (See Appendix - I). The mean of the 10 positive items was calculated along with the mean of the 10 negative items. Higher scores reflected higher levels of positive and negative affect respectively.

Performance. Task performance was assessed by mean radial error, which is the average distance the ball finished from the hole in centimetres (Moore et al.,

2013). Zero was recorded for each putt that was holed, and the mean of the 10 putts was calculated with lower scores indicating better performance.

Analyses

A series of 2 (wanted support: high, low) * 2 (manipulation: support, control) between-subjects analysis of covariance (ANCOVA) were conducted to examine the interaction between support individuals wanted and received upon their performance, affect and self- confidence. Gender was entered as a covariate. To explore a significant interaction, planned comparisons were conducted with low wanted support – control condition set as the reference condition to which the underprovision (high wanted – control), overprovision (low wanted – support manipulation), and adequate support (high wanted – support manipulation) were compared, respectively. A significant level of .05 was used throughout the analyses.

Results

Descriptive statistics. Eighty-eight participants completed the experimental study, and their means, standard deviations and intercorrelations for wanted support, self-confidence, and mean distance are shown in Table 2. The assumptions of normality and homogeneity of variance were met across the different conditions (Field, 2009).

Manipulation check. The results of the manipulation check revealed that participants generally correctly recognised whether the expert golfer provided them with support. In the low wanted support – control condition, 1/22 participants reported receiving support. In the high wanted support – control condition, 2/22 participants reported receiving support. In the low wanted support – experimental condition, 22/22 participants reported receiving support. In the high wanted support – experimental condition, 20/22 participants reported receiving support.

Table 2
Means, standard deviations, and intercorrelations of wanted support, self-confidence, affect, and mean putting distance

	Variable	*M*	*SD*	1	2	3	4
1	Wanted support	9.35	4.30				
2	Self-confidence	2.50	.70	.11			
3	Negative affect	1.38	.43	.21*	-.29*		
4	Positive affect	2.55	.77	.20	.47**	-.35**	
5	Mean distance	44.03	15.78	.03	.01	.16	-.07

Note. $N = 88$. * denotes correlation significant at .05 level (2-tailed).
** denotes correlation significant at .01 level (2-tailed).

Self-confidence. Means and standard deviations of self-confidence as a function of wanted support and the experimental condition are displayed in Table 3. There was no significant effect for gender, $F(1, 83) = 1.32$, $p = .26$, $\eta_p^2 = .02$. There was no significant main effect for wanted support, $F(1, 83) = 3.59$, $p = .06$, $\eta_p^2 = .04$, but there was a significant main effect for the experimental condition, $F(1, 83) = 31.65$, $p < .001$, $\eta_p^2 = .28$. There was a significant interaction effect (see Figure 1) between wanted support and the experimental condition on self-confidence, $F(1, 83) = 39.15$, $p < .001$, $\eta_p^2 = .32$. Planned comparison analyses found that participants in the adequate support condition had significantly higher self-confidence compared to those in the reference condition ($M_{diff} = .83$, $SE = .16$, $p < .001$, 95% CI [.52, 1.14]). Participants in the underprovision condition had significantly lower self-confidence compared to those in the reference condition ($M_{diff} = -.48$, $SE = .16$, $p < .05$, 95% CI [-.79, -.17]). Participants in the overprovision condition were not significantly different to those in the reference condition ($M_{diff} = -.07$, $SE = .16$, $p = .66$, 95% CI [-.38, .24]).

Table 3
Means and standard deviations of self-confidence, positive affect, negative affect, and mean distance for the wanted support and experimental conditions

Support Conditions				
Variables	**Low wanted, Control** *M* (*SD*)	**Low wanted, Support** *M* (*SD*)	**High wanted, Control** *M* (*SD*)	**High wanted, Support** *M* (*SD*)
Self-confidence	2.44 (.51)	2.37 (.64)	1.95 (.47)	3.25 (.43)
Positive affect	2.61 (.61)	2.27 (.51)	2.00 (.66)	3.33 (.60)
Negative affect	1.31 (.35)	1.24 (.22)	1.77 (.57)	1.19 (.21)
Mean distance	46.52 (16.23)	43.21 (18.01)	41.70 (14.26)	44.67 (15.07)

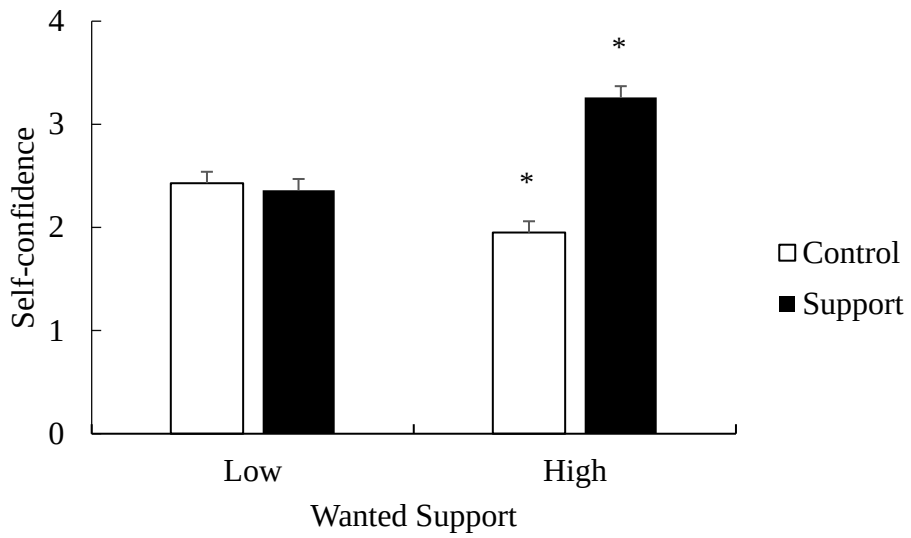

Figure 1. The interaction of wanted support and the experimental condition on self-confidence after controlling for gender. * indicates the condition was significantly different from the reference condition (low wanted, control). The error bars display standard errors.

Positive affect. Means and standard deviations of positive affect as a function of wanted support and the experimental condition are displayed in Table 3. There was no significant effect for gender, $F(1, 83) = 3.70$, $p = .06$, $\eta_p^2 = .04$, and no significant main effect for wanted support, $F(1, 83) = 3.96$, $p = .05$, $\eta_p^2 = .05$. There was a significant main effect for the experimental condition, $F(1, 83) = 15.00$, $p < .001$, $\eta_p^2 = .15$, and a significant interaction effect (see Figure 2) between wanted support and the experimental condition on positive affect, $F(1, 83) = 44.67$, $p < .001$, $\eta_p^2 = .35$. Planned comparison analyses found that participants in the adequate support condition had significantly higher positive affect compared to those in the reference condition ($M_{diff} = .74$, $SE = .18$, $p < .001$, 95% CI [.38, 1.09]). Participants in the underprovision condition had significantly lower positive affect compared to those in the reference condition ($M_{diff} = -.59$, $SE = .18$, $p < .05$, 95% CI [-.94, -.23]). Participants in the overprovision condition did not have significantly different positive affect to those in the reference condition ($M_{diff} = -.35$, $SE = .18$, $p = .05$, 95% CI [-.70, 0.0004]).

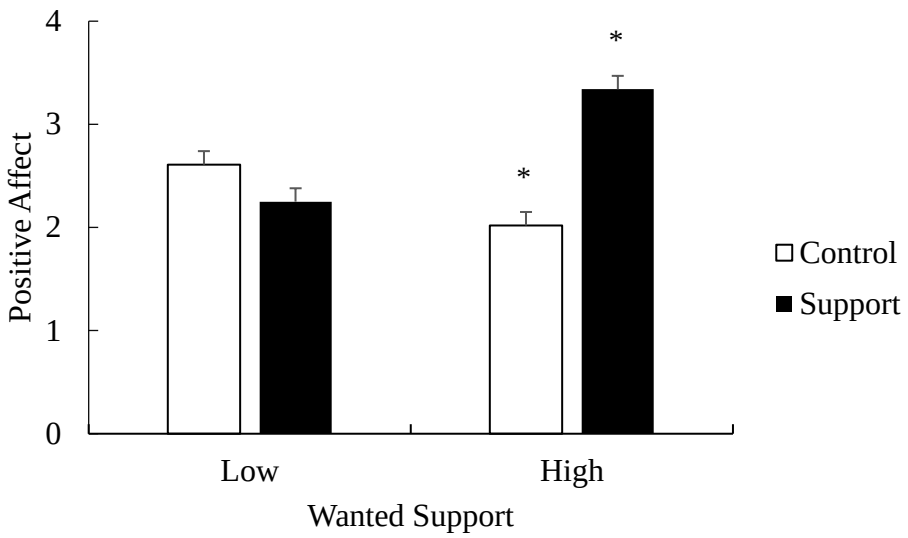

Figure 2. The interaction of wanted support and the experimental condition on positive affect after controlling for gender. * indicates the condition was significantly different from the reference condition (low wanted, control). The error bars display standard errors.

Negative affect. Means and standard deviations of negative affect as a function of wanted support and the experimental condition are displayed in Table 3. There was no significant effect for gender, $F(1, 83) = .31$, $p = .58$, $\eta_p^2 < .01$. There was a significant main effect for both wanted support, $F(1, 83) = 6.38$, $p < .05$, $\eta_p^2 = .07$, and experimental condition, $F(1, 83) = 17.28$, $p < .001$, $\eta_p^2 = .17$, and a significant interaction effect (see Figure 3), $F(1, 83) = 10.60$, $p < .01$, $\eta_p^2 = .11$. Planned comparison analyses found that participants in the adequate support condition were not significantly different compared to those in the reference condition ($M_{diff} = -.13$, $SE = .11$, $p = .26$, 95% CI [-.35, .09]). Participants in the underprovision condition had significantly higher negative affect compared to those in the reference condition ($M_{diff} = .46$, $SE = .11$, $p < .001$, 95% CI [.23, .68]). Participants in the overprovision condition did not have significantly different negative affect to those in the reference condition ($M_{diff} = -.07$, $SE = .11$, $p = .53$, 95% CI [-.29, .15]).

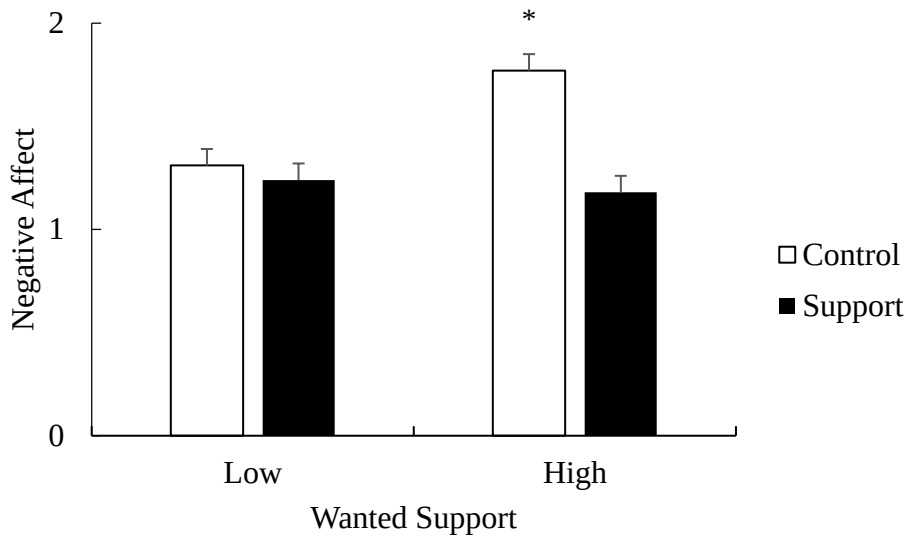

Figure 3. The interaction of wanted support and the experimental condition on negative affect after controlling for gender. * indicates the condition was significantly different from the reference condition (low wanted, control). The error bars display standard errors.

Performance. Means and standard deviations of mean distance as a function of wanted support and the experimental condition are in Table 3. There was no significant effect for gender, $F(1, 83) = 3.69$, $p = .06$, $\eta_p^2 = .04$. There was no significant main effect for wanted support, $F(1, 83) = .52$, $p = .47$, $\eta_p^2 = .01$, or experimental condition, $F(1, 83) < .001$, $p = 1.00$, $\eta_p^2 < .001$, and no significant interaction, $F(1, 83) = .80$, $p = .38$, $\eta_p^2 = .01$.

Discussion

Overall the findings of Study 1 offer partial support for the support adequacy model. Participants who received adequate support had better self-confidence and positive affect than those in the reference condition, but no effect was found on negative affect. Those participants who experienced underprovision of support experienced unfavourable psychological outcomes. Those participants who experienced overprovision of support reported similar psychological outcomes to those in the reference condition. Despite these findings, which are broadly in line with the support adequacy model and previous research, no significant interactions were found between wanted and received support on performance. One limitation of Study 1 was that participants did not attempt the golf-putting task before rating the support that they wanted. Indeed, participants may not have been well placed to accurately evaluate the amount of support that they really wanted. Further, this also meant that no baseline level of performance was established. These issues were addressed in Study 2, in which participants were asked to perform a baseline trial of the golf-putting task before assessing the amount of support that they wanted to receive prior to a second trial.

Study 2

Method

Pilot Study

Thirty students (13 female, 17 male; M_{age} = 25.0, *SD* = 7.5 years) from a British university participated a pilot study. This was to establish the criteria for determining levels of wanted support levels in the main study. The majority of the sample was White (73.3%), with Asians accounting for 13.3% of the sample. Participants had competed for a mean of 9.2 (*SD* = 7.9) years in various individual (*n* = 15) and team (*n* = 15) sports at recreational (*n* = 14), club (*n* = 13), regional (*n* = 2), or national (*n* = 1) level. All participants had either very little experience or no experience of golf-putting.

In the pilot study, all participants were asked to perform a golf-putting task comprising 10 putts from a distance of 2m using a putter with a flexible shaft and then rate the support that they would want to receive from a golf coach if they were to perform the task again on the 16-item wanted support questionnaire used in Study 1. Low wanted support was categorised as wanted support scores less than 10 (*n* = 6 in pilot study), moderate wanted support was categorised as 10 to 11 (*n* = 13), and high wanted support was categorised as scores greater than 11 (*n* = 11 in pilot study).

Participants and Design

In the main study, participants were a sample of 91 (25 female, 66 male; M_{age} = 22.9, *SD* = 5.6 years) students in a British university. The majority of sample were White (75.8%), with Asians accounting for 9.9% of the sample. Participants had competed for a mean of 8.1 (*SD* = 5.7) years in various individual (*n* = 42) and team (*n* = 46) sports at recreational (*n* = 38), club (*n* = 29), regional (*n* = 12), national (*n* = 7), or international (*n* = 2) level. Three participants reported that they did not have a

main sport. All participants reported having either very little experience or no experience of golf-putting. The 91 participants were drawn from an initial sample of 120 (34 female, 86 male; mean age = 22.8, *SD* = 5.2 years) participants who were asked to perform the golf-putting task, and then rate the support that they would want if they performed the task again. The 29 participants who wanted moderate level of support (range 10 – 11) were excluded from the analysis in Study 2. The study had two between-subjects factors, with two levels to each factor (wanted support: high, low; manipulation: support, control), and one within-subjects factor (time) as outcomes were assessed at baseline and post-manipulation.

Materials

The experiment involved the same golf-putting task and equipment as Study 1.

Procedure

The study was approved by a university ethics committee and participants provided informed consent. The experimenters were one postgraduate and two undergraduate sports and exercise science students (3 males). The first experimenter (the first author) delivered the general instructions and scored the putting task; the second experimenter was introduced as a golf coach to the participants, and he delivered the support manipulation; and the third experimenter calculated the wanted support scores and managed the allocation of participants into different conditions.

Initially, all participants provided demographic information (See Appendix - II) before being given task instructions by the first experimenter. Participants were instructed from a standardised script that the nature of the study was to understand about task performance using a modified putter (shown to participants) under experimental conditions, followed by an explanation of the golf-putting task and its

scoring system. Following these instructions, participants completed a measure of self-confidence and then performed the task (10 golf-putts from a 2m location to a regular-size hole). After this baseline task, participants completed a measure of how much support they wanted from the golf coach if they were to perform the golf-putting task again as well a measure of their coping skills[1].

Before performing the golf-putting task again, participants in both the high wanted support group (n = 40) or the low wanted support group (n = 51) were randomly assigned to an experimental (received) support condition or a control condition by the second experimenter. The high and low wanted support groups were established by the third experimenter. The first experimenter was blind to whether the participants had scored high or low on wanted support and to whether they would receive the support manipulation or the control condition. The second experimenter was blind to whether the participants wanted high or low levels of support. Participants were also blind to the purpose of the study. There were 26 participants in the low wanted support/control condition, 25 participants in the low wanted support/received support condition, 19 participants in the high wanted support/control condition, and 21 participants in the high wanted support/received support condition. Prior to attempting the task a second time, all participants received further instructions highlighting the importance of the task, that a leaderboard would be emailed to all participants and displayed on a noticeboard, the task would be filmed and shown in lectures and presentations, three participants with the worst performance would be interviewed, and cash prizes would be awarded for the top three performers (£30, £20, £10, respectively). In addition to the general instructions, participants in the experimental support conditions were provided the same script

[1] The third experimenter calculated the wanted support scores when participants completed a coping skills questionnaire. We also controlled coping skills as a covariate in the analysis; a similar pattern was found therefore we do not discuss it further in the study.

message as used in Study 1.

After the support manipulation, participants completed a manipulation check and measures of self-confidence. The task (10 golf-putts) was then performed. Once the participants completed the task, they were thanked and debriefed about the aims of the study.

Measures

Wanted support. Wanted support was assessed using the same measure as Study 1 (See Appendix - II).

Coping skills. A modified section of Stress Audit Questionnaire (Miller & Smith, 1982) was used to evaluate general coping skills. This modified 12-item scale has been used to evaluate coping skills in sports contexts (Raedeke & Smith, 2004). Participants evaluated how often they conducted 12 behaviours in different life contexts, including "I regularly attend club or social activities", "I am in good health (including eyesight, hearing, teeth)", and "I am able to organise my time effectively". Participants responded on a 5-point Likert scale from 1 (*Always*) to 5 (*Never*) (See Appendix - II). The mean of the 12 items was calculated with lower scores indicating superior coping skills.

Manipulation check. The same manipulation check was used as in Study 1 (See Appendix - II).

Self-confidence. Self-confidence was assessed using the same measure as Study 1 (See Appendix - II).

Performance. Task performance was assessed by mean radial error as in Study 1.

Analyses

A 2 (time: baseline, post-manipulation) * 2 (wanted support: high, low) * 2

(manipulation: support, control) mixed-model analysis of covariance (ANCOVA) was conducted on the scores in the golf-putting task and self-confidence to investigate the interactive effect of the support individuals wanted and received on their performance and self-confidence across the two-time points, after controlling gender effects. To explore a significant interaction, initially a difference score was calculated for performance and then self-confidence by using the post-manipulation score minus the baseline score. Similar to the Study 1, planned comparisons were conducted with low wanted support – control condition set as the reference condition to which the underprovision (high wanted – control), overprovision (low wanted – support manipulation), and adequate support (high wanted – support manipulation) were compared upon the performance and self-confidence, respectively, after controlling gender effects and baseline outcomes. A significant level of .05 was used throughout the analyses.

Results

Descriptive statistics. The mean score for wanted support in the initial sample of 120 participants was 10.11 (*SD* = 3.21, Median = 10.00). Consistent with the pilot study, participants with a wanted support was less than 10 were categorised as low wanted support (*n* =51), and those with a wanted support score of greater than 11 were categorised as high wanted support (*n* =40). These 91 participated completed the experimental study, and their means, standard deviations and intercorrelations for wanted support, self-confidence, and mean distance at baseline and post-manipulation are represented in Table 4. The assumptions of normality and homogeneity of variance were satisfied across the different groups (Field, 2009). The assumption of sphericity was met as there were only two levels of the time factor (i.e., baseline and post-manipulation) (Field, 2009).

Manipulation check. The results of the manipulation check revealed that participants generally correctly recognised whether the golf coach provided them with support. In the low wanted support and control condition, only 3/26 participants reported receiving support. In the high wanted support and control condition, 0/19 participants reported receiving support. In the low wanted support and experimental condition, 25/25 participants reported receiving support. In the high wanted support and experimental condition, 21/21 participants reported receiving support.

Table 4
Means, standard deviations, and intercorrelations of wanted support, self-confidence, and mean putting distance at baseline and post-manipulation

	Variable	*M*	*SD*	1	2	3	4
1	Wanted support	10.03	3.67				
2	Self-confidence (baseline)	2.39	.69	.06			
3	Mean distance (baseline)	42.57	15.52	.22*	.04		
4	Self-confidence (post-manipulation)	2.73	.75	.02	.42**	-.25*	
5	Mean distance (post-manipulation)	36.07	16.65	.12	-.31*	.43**	-.40**

Note. $N = 91$. * denotes correlation significant at .05 level (2-tailed).
** denotes correlation significant at .01 level (2-tailed).

Self-confidence. Means and standard deviations of self-confidence as a function of wanted support and the experimental condition at baseline and post-manipulation are displayed in Table 5. After controlling for gender, there was a significant main effect of experimental condition on self-confidence, $F(1, 86) = 17.02$, $p < .001$, $\eta_p^2 = .17$. There was not a significant main effect of time, $F(1, 86) = 1.56$, $p = .22$, $\eta_p^2 = .02$, or wanted support, $F(1, 86) = 1.40$, $p = .24$, $\eta_p^2 = .02$, on self-confidence. There was not a significant interaction between time and wanted support on self-confidence, $F(1, 86) < .001$, $p = .99$, $\eta_p^2 < .001$, nor a significant interaction between wanted support and experimental condition, $F(1, 86) = 3.50$, $p = .07$, $\eta_p^2 = .04$. The interaction between time and experimental condition on self-confidence was significant, $F(1, 86) = 21.28$, $p < .001$, $\eta_p^2 = .20$. Importantly, beyond these lower-order effects, there was a significant three-way interaction between time, wanted support level and experimental condition on self-confidence, $F (1, 86) = 7.92$, $p < .01$, $\eta_p^2 = .08$.

Table 5
Means and standard deviations of wanted support and experimental condition for self-confidence and mean distance at baseline and post-manipulation

Variables	**Low wanted, Control** *M* (*SD*)	**Low wanted, Support** *M* (*SD*)	**High wanted, Control** *M* (*SD*)	**High wanted, Support** *M* (*SD*)
	Support Conditions			
Self-confidence				
Baseline	2.27 (.62)	2.37 (.75)	2.36 (.84)	2.57 (.54)
Post-manipulation	2.47 (.69)	2.83 (.72)	2.15 (.45)	3.45 (.42)
Mean distance				
Baseline	41.40 (15.12)	38.68 (16.26)	44.79 (13.77)	46.65 (16.36)
Post-manipulation	35.77 (15.36)	35.49 (15.65)	46.48 (20.46)	27.74 (10.27)

Follow-up tests exploring the three-way interaction. After controlling for gender and baseline self-confidence, planned comparison analyses (See Figure 4) showed that the self-confidence difference score was significantly higher for the individuals with the adequate support condition compared to those in the reference condition (M_{diff} = .85, SE = .16, p < .001, 95% CI [.53, 1.17]). The self-confidence difference score was significantly lower for the individuals in the underprovision condition compared to those in the reference condition (M_{diff} = -.33, SE = .16, p < .05, 95% CI [-.66, -.01]). The self-confidence difference score was significantly higher for the individuals in the overprovision condition compared to those in the reference condition (M_{diff} = .34, SE = .15, p < .05, 95% CI [.04, .64]).

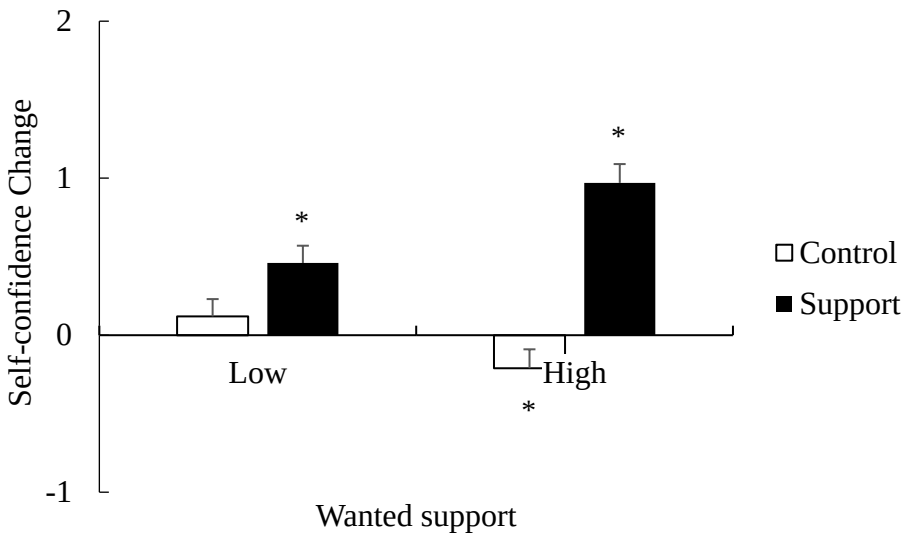

Figure 4. Self-confidence changes as a function of wanted support and experimental condition after controlling for gender and baseline self-confidence. * indicates that the difference score for the condition was significantly different from the reference condition (low wanted, control). The error bars display standard errors.

Performance. Means and standard deviations of mean distance as a function of wanted support and the experimental condition at baseline and post-manipulation are displayed in Table 5. After controlling for gender, there were no significant main effects on performance for time, $F(1, 86) = .73$, $p = .39$, $\eta_p^2 = .01$, wanted support, $F(1, 86) = 2.09$, $p = .15$, $\eta_p^2 = .02$, or experimental condition, $F(1, 86) = 2.34$, $p = .13$, $\eta_p^2 = .03$. There was not a significant interaction between time and wanted support on performance, $F(1, 86) = 1.60$, $p = .21$, $\eta_p^2 = .02$, nor a significant interaction between wanted support and experimental condition, $F(1, 86) = .65$, $p = .42$, $\eta_p^2 = .01$.The interaction between time and experimental condition on performance was significant, $F(1, 86) = 7.42$, $p < .01$, $\eta_p^2 = .08$. Beyond these lower-order effects, there was a significant three-way interaction between time, wanted support level and experimental condition on performance, $F(1, 86) = 11.86$, $p < .001$, $\eta_p^2 = .12$.

Follow-up tests exploring the three-way interaction. After controlling for gender and baseline mean distance, planned comparison analyses (See Figure 5) showed that the difference score for performance was significantly lower for the individuals in the adequate support condition compared to those in the reference condition ($M_{diff} = -9.96$, $SE = 4.13$, $p < .05$, 95% CI [-18.17, -1.75]). The performance difference score was significantly higher for the individuals in the underprovision condition compared to those in the reference condition ($M_{diff} = 8.79$, $SE = 4.20$, $p < .05$, 95% CI [.46, 17.13]). The performance difference score was not significantly different for individuals in the overprovision condition compared to those in the reference condition ($M_{diff} = .77$, $SE = 3.89$, $p = .84$, 95% CI [-6.96, 8.51]).

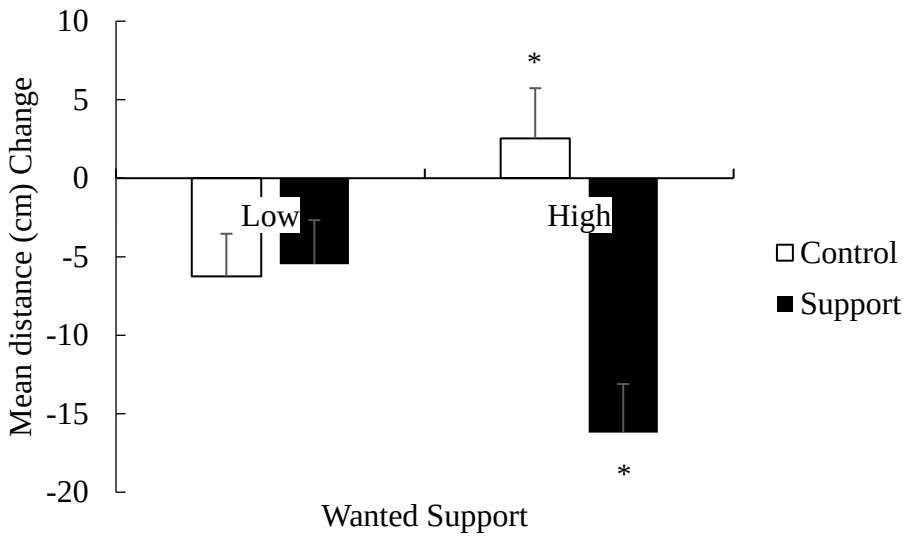

Figure 5. Mean distance changes as a function of wanted support and experimental condition after controlling for gender and baseline mean distance. * indicates that the difference score for the condition was significantly different from the reference condition (low wanted, control). The error bars display standard errors.

Discussion

Overall the findings of Study 2 provide more empirical evidence for the support adequacy model. Participants who received adequate support had significantly greater improvements in self-confidence and golf-putting task performance compared to those in the reference condition; those participants who received underprovision of support had worse self-confidence and golf-putting performance compared to those in the reference condition; those participants who experienced overprovision of support experienced significantly greater improvements in self-confidence but performed similarly compared to those in the reference condition.

General Discussion

The overarching aim of the current studies was to explore whether the support that individuals wanted influenced the effects of received support. Overall, the current findings provided consistent evidence that the receipt of support did benefit the psychological outcomes, and some evidence for its impact upon the performance of a golf-putting task. The potential for received support to exert beneficial effects on affect, self-confidence, and performance is congruent with previous evidence in sport psychology (e.g., Freeman et al., 2014; Moll et al., 2017; Rees & Freeman, 2007). These experiments are unique in a sport context, however, in demonstrating that received support is particularly beneficial for those individuals who wanted high levels of support and is less effective for individuals who did not want support. Further, the findings highlight the negative impact upon psychological outcomes and performance of individuals not receiving as much support as they want. These results provide evidence for using the support adequacy model to explain the effects of received support in sport.

The current findings within a sporting context are consistent with evidence for the effects of (in)adequacy between wanted and received support on well-being in organisational settings (Beehr et al., 2010; Seiger & Wiese, 2011; Young & Perrewé, 2000), in patients with physical and mental disease (Cho, Zunin, Chao, Heiby, & McKoy, 2012; High & Steuber, 2014; Koenders et al., 2015; Linden & Vodermaier, 2012; Reynolds & Perrin, 2004; Thong et al., 2007), in couples (Bar-Kalifa & Rafaeli, 2013; Brock & Lawrence, 2008, 2009; Brock et al., 2014; Joseph et al., 2016), and in different cultures (Barden et al., 2016; Faw et al., 2018; Li & Fung, 2012; Melrose et al., 2015; Siewert et al., 2011; Wolff et al., 2013; Yoo, 2013). Very few studies, however, have examined the interactive effect of wanted and received support on performance. Similar to the present experiments, Searle et al. (1999; 2001) found the effects of support (in)adequacy were inconsistent across two studies. Using a cognitive task, only the study by Searle et al. (2001) found that individuals had better performance when they received adequate emotional support. In the present research, adequate support aided motor performance but only in Study 2, in which wanted support was assessed after a baseline attempt. It may be that it is important to control for baseline performance or that this baseline attempt allows individuals to more accurately assess their support needs. The inconsistent findings of support (in)adequacy on performance (either cognitive or motor task) highlight a need for more research. Future research examining the support adequacy model should consider adopting within-subject experimental designs in favour of between-subject designs.

The present research found that those individuals who experienced adequate support experienced favourable outcomes. This finding is broadly consistent with the predictions of the support adequacy model and previous research. For example,

receiving adequate support has been found to be associated with better well-being (e.g., Bar-Kalifa & Rafaeli, 2013; Siewert et al., 2011; Wolff et al., 2013). Crucially, the current experiments differentiated between those individuals who wanted support and received it (i.e., the matched support condition) versus those who didn't want support and didn't receive it (i.e., the reference condition). Despite both groups receiving the amount of support that they had wanted, those participants who wanted and received high levels of support experienced significantly better outcomes across both studies than those who wanted and received low of levels of support. This finding provides a more nuanced understanding of the support adequacy model compared to those studies which have not assessed different forms of adequate support (e.g., Joseph et al., 2016; Matsunaga, 2011; Ślebarska et al., 2009), and suggests that future research should be cautious in how they conceptualise and measure (in)adequate support. Importantly, the findings also provide important empirical evidence that athletes should be encouraged to recognise that wanting support is not a sign of weakness (Pensgaard & Roberts, 2003), and it can actually benefit affect, confidence and performance provided that the support is forthcoming.

Despite the potential for received support to exert beneficial effects, the current studies found that for individuals who did not want support, those who received it typically experienced little benefit compared to those individuals in the control condition (i.e., who received no support). Previous evidence regarding the impact of the overprovision of support has been mixed. For example, studies have found support overprovision is beneficial (e.g., Siewert et al., 2011), ineffective (e.g., Bar-Kalifa & Rafaeli, 2013) or even detrimental (e.g., Brock & Lawrence, 2009). The present research found that overprovision of support is largely ineffective. On one hand, this suggests that providers would not contribute to detrimental outcomes for

the recipient by offering support and this may be a more desirable course of action than withholding support if they are unsure whether athletes want it. However, the findings also suggest that providers may exert unnecessary time and effort offering support that does not help, and therefore could be educated to recognise when it is important to provide supportive resources (i.e., only when athletes want support). Further research though is encouraged to examine the effect of overprovision. It should be noted that in the present studies, participants were instructed that the support provider was an expert, so it is unclear if overprovision of support would have different effects if it emanates from a less knowledgeable and credible source.

Consistent with the predictions of the support adequacy model, the current studies found that those participants who experienced underprovision of support experienced unfavourable outcomes. This is in line with the consistent evidence that underprovision is detrimental to the well-being (e.g., Bar-Kalifa & Rafaeli, 2013; Gremigni et al., 2011; Siewert et al., 2011; Wolff et al., 2013). Underprovision of support may lead individuals to feel disappointed with their relationship (Bar-Kalifa & Rafaeli, 2013), and result in unfavourable affect, lower self-confidence and poorer performance. Indeed, individuals tend to be more sensitive to the negative experience of not receiving something that they actually wanted (Rafaeli, Cranford, Green, Shrout, & Bolger, 2008). This is an important phenomenon to recognise for researchers and practitioners as negative stimuli can exert more powerful impacts on outcomes compared to positive stimuli (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001).

There are some limitations of the present research that should be noted. First, all the participants were novice golfers and therefore it is unclear if the findings would translate into experts. Second, although participants were not golfers, some

competed to a high-level in other sports. The physical and psychological skills developed in those sports may have influenced affect, confidence and performance on the golf-putting task (Collins, Collins, Macnamara, & Jones, 2014)[2]. Third, although the support provider in each study was presented as an expert golfer, he was from outside of the participants' social networks. Future research should therefore examine if the findings would be consistent for providers within athletes' existing support network and who are also less knowledgeable.

Despite these limitations, this study has both theoretical and practical implications. The current findings contribute to the literature in terms of understanding the interactive effects of wanted and received support in achievement contexts and by providing evidence for the support adequacy model. The findings suggest that received support may only have beneficial effects on outcomes when the recipient actually wants support. Such findings may explain why support-related interventions to enhance individuals' health and well-being have had mixed effects (Embuldeniya et al., 2013). That is, interventions that provide similar supportive messages to all recipients, do not account for the levels of support those individuals want. Future interventions should therefore be tailored towards the amount of support wanted by recipients. Equally, existing athlete support personnel, such as parents and coaches, should be educated that the effects of received support are contingent on the support that athletes actually want, and also helped to recognise and respond to these needs.

In conclusion, the results of the present research suggest that wanted and received support have an interactive effect on outcomes. Received support was found

[2] Theoretically, age, ethnicity, competitive level, years of playing sport, related sport skills may influence the effectiveness of received support upon task performance. However, when we controlled those variables, a similar pattern of effects of wanted and received support on psychological and performance outcomes was found to those reported in the chapter.

to be beneficial, but only for individuals who wanted high levels of support and not those who did not want support. The findings also highlight that underprovision of support can be detrimental, which further emphasises the importance of providing adequate levels. These studies therefore provide important experimental evidence for the support adequacy model, highlight that it is a useful framework to explain the effects of received support in sport, and suggest that an athlete's support network should be alert to the support that the athlete wants and tailor their supportive actions.

Table 6

The aims and main findings of Chapter 2a and Chapter 2b, and aim of Chapter 3

Chapter	Aim	Findings
2a	• To investigate whether the support (in)adequacy influences sport performance and psychological well-being	• The adequate support (high wanted, support) group reported better self-confidence and positive affect compared to reference condition (low wanted, control). • The underprovision (high wanted, control) group reported worse self-confidence, positive affect, and negative affect compared to reference condition (low wanted, control). • The overprovision (low wanted, control) group reported similar self-confidence, positive affect, and negative affect compared to reference condition (low wanted, control). • No significant interactions were found between wanted and received support on performance.
2b	• To investigate whether the support (in)adequacy influences changes in sport performance and psychological well-being	• The adequate support (high wanted, support) group had better self-confidence change (from baseline) and performance change (from baseline) compared to reference condition (low wanted, control). • The underprovision (high wanted, control) group had worse self-confidence change (from baseline) and performance change (from baseline) compared to reference condition (low wanted, control). • The overprovision (low wanted, control) group had better self-confidence change (from baseline) and similar performance change (from baseline) compared to reference condition (low wanted, control).
3	• To investigate whether support (in)adequacy influences psychological well-being and whether these effects operate indirectly via satisfaction with support using polynomial regression analyses. • To examine if the effects of support in(adequacy) are consistent across British and Chinese athletes.	

Chapter 3: The Effects of (In)adequacy of Wanted and Received Support on Well-being in British and Chinese Athletes

Introduction

Social support is an important psycho-social factor impacting mental and physical health and wellbeing (See reviews, Berkman et al., 2000; Thoits, 2011; Uchino, 2009). In the last two decades, researchers have recognised the beneficial role of social support in sporting contexts (Rees, 2007; Rees & Hardy, 2000). In sport and the wider literature, however, most studies have investigated the effects of social support among Western populations, with few studies focused on Eastern populations (Kim et al., 2008). As such, there is limited understanding of whether the cultural differences exist in the amount of social support exchanged or its influence on health and well-being. The present study addresses these issues by examining the influence of wanted and received support on affect and self-confidence in athletes from Western and Eastern cultures.

Both the general and sport psychology literature have found that the perception of an individual that support is available in times of need (i.e., perceived support) was universally beneficial to well-being and performance-related outcomes (e.g., Freeman et al., 2011; Uchino, 2009; for more details, see Chapter 1). An individual's reported receipt of supportive resources and behaviours (i.e., received support), however, has been found inconsistently associated with well-being and performance-related outcomes (e.g., DeFreese & Smith, 2013; more details, see Chapter 1). One explanation for the ineffectiveness of received support is that the receipt of support might not match the amount of support wanted by the recipient (Dehle et al., 2001). Specifically, the support adequacy model identifies three specific concepts: underprovision (recipients receive less support than wanted), support adequacy (recipients receive the same amount of support as wanted), overprovision

(recipients receive more support than wanted). Support adequacy has generally been positively associated with well-being (e.g., Melrose et al., 2015), whereas underprovision of support has been universally harmful (e.g., Siewert et al., 2011). The effects of overprovision of support are less clear, as it can be beneficial (e.g., Huang, 2012), ineffective (e.g., Bar-Kalifa & Rafaeli, 2013), or even detrimental (e.g., Brock & Lawrence, 2009). A full review of this literature can be found in Chapter 1. Despite promising evidence for its predictions in health and social psychology, limited research has investigated the support adequacy model in sporting contexts. Chapter two, however, provided experimental evidence that the impact of received support on affect, self-confidence and performance in athletic context may vary depending on how much support individuals wanted. Such evidence highlights the importance of examining the consequence of received support not meeting what athletes want, but it is crucial to explore these relationships in different populations, identify how (in)adequate support exerts effects, and to utilise non-experimental research designs in naturalistic settings.

Beyond understanding the importance of receiving adequate support in sporting contexts, it is imperative to identify if such effects generalise across individuals. The effects of support adequacy on health and well-being have mainly been explored in Western cultures (e.g., Bar-Kalifa & Rafaeli, 2013). Some researchers (Faw et al., 2018; Xu & Burleson, 2001), however, found that there was a difference between Eastern samples (i.e., Chinese) and Western samples (i.e., American) regarding their desires and receipt of supportive behaviours. Previous research examining cultural differences in social support has found that compared to people from Western cultures, those from Eastern cultural backgrounds report less frequent use of social support (e.g., Taylor et al., 2004) and perceive it to be less

helpful (e.g., Kim et al., 2006). Previous research noted that the cultural differences may reflect people's values of receiving help from others (Kim et al., 2008). More specifically, people from individualistic cultures, such as United Kingdom, typically view the self and relationships in an independent manner, therefore, they may receive or provide support without a sense of obligation (Kim et al., 2008). On the other hand, people from collectivistic cultures, such as China, typically view the self and relationship in an interdependent manner, and may view collective benefits as more crucial than personal ones, therefore, they may not want to burden others by seeking support (Kim et al., 2008). In addition to understanding differences in the extent to which support is exchanged within different cultures, it is important to examine if the adequacy model reflects support processes in both Western and Eastern populations. Indeed, some limited evidence shows that the effects of support adequacy on well-being may extend to Eastern samples (e.g., Huang, 2012). For example, discrepancies between wanted and received support were found to be negatively related with well-being among Chinese populations, including marital quality (Li & Fung, 2012) and students' adjustment to university (Jou & Fukada, 1995, 1996). Moreover, overprovision of support was associated with greater life satisfaction among elderly Chinese who lived in rural areas, but not among elderly city residents (Huang, 2012). More studies are needed to investigate support adequacy among Eastern populations.

Consistent with calls to understand mechanisms in the wider social support literature (Thoits, 2011), it is important to understand how (in)adequate support influences well-being. Satisfaction with received support may be key in this regard. Theoretically, if individuals receive less support than they want, they should experience lower satisfaction; in contrast, if individuals receive the same or more support than they want, they should experience more satisfaction (Cutrona, 1996).

Indeed, Bianco (2001) found that injured elite skiers were less satisfied with their coaches' support when they expected more support than they received; whereas the skiers were more satisfied with their support when the coaches' supportive behaviours met or surpassed the support they wanted. Unlike the mixed effects for the receipt of support, satisfaction with support has generally been associated with favourable outcomes among athletes, including reduced anxiety and depression (Covassin et al., 2014; Yang et al., 2014), lower stress and burnout (Raedeke & Smith, 2004), and better team identification and cohesion (De Backer et al., 2011).

The support adequacy model has been examined using a number of statistical approaches, including: 1) difference scores (received support minus wanted support; e.g., Bar-Kalifa & Rafaeli, 2013); 2) ratio scores (received support divided by wanted support; e.g., Melrose et al., 2015); 3) interaction scores (received support multiplied by wanted support: Silverstein et al., 1996); 4) perceived support (in)adequacy (individuals' perceptions of whether they received less, the same or more support than they wanted; e.g., Brock & Lawrence, 2008). The most common approach for investigating the support adequacy model, however, has been difference scores, but this method is problematic (Edwards, 2001). For example, Edwards highlighted that difference scores can have low internal consistency reliability and reduced effect sizes. Further, difference scores reduce two conceptually different variables (e.g., wanted support and received support) into one overall score, which lacks sensitivity. For example, a score of 0 can represent an individual who wanted and received very low support through to an individual who wanted and received very high support. These problems are not fully eliminated with ratio or interaction scores or perceptions of support (in)adequacy. One solution is to employ polynomial regression with response surface methodology (Cafri et al., 2010; Edwards, 2002; Shanock, Baran,

Gentry, Pattison, & Heggestad, 2010).

The polynomial regression model consists of individual components (e.g., wanted and received support), curvilinear terms (quadratic and higher-order polynomials), and product terms (interaction of two components). Accounting for the two components and their joint effects in a regression model could reduce the potential confounding effects (Cafri et al., 2010). This method generates a more comprehensive and nuanced test of how wanted and received support influences outcomes, and therefore could statistically and conceptually improve understanding of the support adequacy model. Further, response surface methodology can also be used to create three-dimensional plots and demonstrate the linear and nonlinear relationships between the two components and the outcomes. This is achieved by deriving the coefficients from the polynomial regression equation linking two components (e.g., wanted and received support) to the outcomes. The slope and curvature of the surface along the line of perfect congruence (i.e., wanted support = received support) can be examined along with the slope and curvature of the surface along (the line of perfect incongruence [i.e., wanted support = - received support]) (Cafri et al., 2010; Edwards, 2002; Shanock et al., 2010). The slope of the line of congruence focuses on whether there is a linear relationship between congruent support and outcomes at low levels of two components compared to the increasingly higher levels. The curvature of the line of congruence focuses on whether there is a non-linear relationship between congruent support as levels of wanted and received support increase. The slope of the line of incongruence focuses on whether the direction of the discrepancy is related to outcomes (e.g., is underprovision or overprovision more favourable?). The curvature of the line of incongruence focuses on whether the outcomes are influenced as the degree of discrepancy between wanted

and received support increases.

The primary aim of the current study was to examine the support (in)adequacy model in sport. The secondary aims were to examine if support adequacy influenced well-being by enhancing satisfaction with support, and whether these effects were consistent across British and Chinese athletes. According to Maisel and Gable (2009), received support would be beneficial to the well-being when it was responsive to the recipients' needs. Also, a daily diary study showed that individuals experienced better mental and relational outcomes when they received support that they wanted, rather than when they did not want support and did not receive it (Bar-Kalifa & Rafaeli, 2013). Therefore, we hypothesised that congruency between wanted and received support would be positively related to well-being, and well-being would be particularly favourable at higher levels of wanted and received support compared to lower levels. Based on the consistently harmful effects of underprovision (e.g., findings of Chapter 2; Siewert et al., 2011), we hypothesised that discrepancy would be negatively related to well-being, and underprovision would be even more detrimental than overprovision. We further hypothesised that these effects would be partially mediated by satisfaction with support. Given the limited research examining cultural variations in social support processes in sport, no specific hypotheses were made for cultural differences.

Method

Participants

British sample. The British sample comprised 236 British university athletes (107 female, 129 male) with a mean age of 20.7 years (SD = 2.4). Participants had competed for a mean of 7.5 years (SD = 4.0) in 37 different sports (17 individual and 20 team sports) at club (n = 157), regional (n = 51), national (n = 19), or international

(*n* = 8) level.

Chinese sample. The Chinese sample comprised 265 Chinese university athletes (189 female and 76 male), with a mean age of 20.8 years (*SD* = 2.5). Participants had competed for a mean of 5.3 years (*SD* = 3.4) in 15 different sports (9 individual and 6 team sports) at club (*n* = 143), regional (*n* = 43), national (*n* = 47), or international (*n* = 9) level.

Procedures

The cross-sectional study was approved by a university ethics committee and participants provided informed consent. Participants were recruited at training sessions and asked to complete paper-and-pencil questionnaires that assessed wanted support, received support, satisfaction with support, self-confidence, and affect.

Measures

Translation procedures. Unlike the measures of self-confidence and affect used (see details below), there was no existing Chinese versions of the wanted and received support and support satisfaction measures. Therefore, these questionnaires (including consent forms) were translated into Chinese before data collection. Two independent bilingual translators conducted the translation and back-translation of the instruments. Then the original instruments were compared with the back-translation version and any discrepancies revised via discussions between the translators and the first author (native Chinese) were all resolved.

Received support. Received support was assessed using the Athletes' Received Support Questionnaire (ARSQ; Freeman et al., 2014). Freeman and colleagues demonstrated that valid and reliable data could be obtained using the ARSQ. Participants were asked to indicate the frequency with which they had received different supportive behaviours from people (e.g., family, friends,

teammates, coaches, fitness trainers) in competitions, training, and non-sporting contexts during the last week. Following the generic stem, “In the last week, how often did people…”, participants rated 22 items such as “cheer you up”, “encourage you”, “give you advice about performing in competitive situations”, and “help plan your training”. Participants responded on a five-point scale ranging from *not at all* to *seven or more times* (coded 1-5 for analysis) (See Appendix - III). The mean of the 22 items was calculated with higher scores reflecting more received support.

As the ARSQ was originally developed in British samples, a pilot study was performed to examine the content validity of the translated Chinese version. Specifically, 30 sport science students (10 female, 20 male; M_{age} = 20.0 years, *SD* = 1.2) in a Chinese university were presented with 22 items of the Chinese version of ARSQ (ARSQ-C), and asked to rate how well they understood each item (0-4; *not at all well* to *extremely well*) and its relevance to athletes across different sports and competitive levels (0-4; *not at all relevan*t to *extremely relevant*) (See Appendix - III).

Content validity indices for all items for both understanding and relevance were calculated as the proportion of participants who responded with a score 3 or 4 (Polit & Beck, 2006). A content validity index for scale was calculated for understand and relevance as the mean of their respective item content validity indices (Polit & Beck, 2006). At least 83% of students reported the items of ARSQ-C were well understood (*M*s = 3.07 – 3.73, *SD*s = 0.50 – 0.81) and relevant (*M*s = 3.10 – 3.50, *SD*s = 0.51 – 0.77). The item content validity indices were .83 – 1.00 for both understanding and relevance, and the scale content validity index were both .91. These values meet the criterion recommended by Polit and Beck (2006).

Wanted support. Wanted support was assessed using a revised version of ARSQ. Compared to the ARSQ, no modifications were made to the items or response

options, but the generic stem was modified to “In the last week, how often did you want people to…” Participants were asked to indicate the frequency with which they wanted to receive each type of support during the last week ranging from *not at all* to *seven or more times* (coded 1-5 for analysis) (See Appendix - III). The mean of the 22 items was calculated with higher scores reflecting greater wanted support. The Chinese version used the same translated 22 items of ARSQ as mentioned above (See Appendix - III).

Satisfaction. Satisfaction with support was assessed by adapting the ARSQ. No modifications were made to the items, but the generic stem was modified to “in the last week, how satisfied were you with the quality of support around whether people did…” Participants responded on a six-point scale ranging from *very dissatisfied* to *very satisfied* (coded 1-6 for analysis). These response options were taken from the satisfaction scale of the 6-item short form of the Social Support Questionnaire (SSQ6; Sarason, Sarason, Shearin, & Pierce, 1987) (See Appendix - III). The mean of the 22 items was calculated with higher scores reflecting greater satisfaction with support. The Chinese version used the same translated 22 items of ARSQ as mentioned above (See Appendix - III).

Self-Confidence. Self-confidence was assessed using the five-item scale from the Revised Competitive State Anxiety Inventory-2 (CSAI-2R; Cox et al., 2003). The measure can provide data with good internal consistency reliability and has been used in previous social support research (Rees & Freeman, 2007). Participants assessed how confident they felt about their upcoming competition on a four-point scale ranging from 1 (*not at all*) to 4 (*very much so*). Sample items included “I feel self-confident” and “I’m confidence because I can mentally picture myself reaching my goal” (See Appendix - III). The mean of the five items was calculated with higher

scores reflecting greater self-confidence. The Chinese version of Competitive State Anxiety Inventory-2 was employed among Chinese athletes (Zhu, 1994), but with only the five items from the CSAI-2R included as the same as the English version in the current research (See Appendix - III).

Affect. Positive and negative affect were assessed by the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). The PANAS has been employed in various sport-related studies (Davis & Jowett, 2014; Freeman et al., 2014) and findings have supported it can obtain reliability within a sporting context. The PANAS contains two 10-item sub-scales, one to measure positive affect and the other to measure negative affect. The positive affect contains items such as “excited” and “strong”, whereas the negative affect scale includes items such as “upset” and “scared”. Participants were asked to report the extent to which they felt each item right now on a five-point scale ranging from 1 (*not at all*) to 5 (*extremely*) (See Appendix - III). The mean of the 10 positive items was calculated along with the mean of the 10 negative items. Higher scores reflected higher levels of positive and negative affect respectively. The Chinese version of Positive and Negative Affect Schedule was employed among Chinese athletes (Huang, Yang, & Li, 2003) (See Appendix - III).

Analyses

Initially, a series of independent-samples *t*-tests were conducted to compare wanted support, received support, satisfaction with support, self-confidence, and positive and negative affect in British and Chinese athletes, respectively. The primary analyses were then conducted separately for the British and Chinese samples. Following the recommendations of Shanock et al. (2010), the base rate of (in)congruence between wanted and received support was calculated before we

conducted the polynomial regression analyses. The scores of wanted and received support were standardised, and then the standardised wanted support score was subtracted from the standardised received support score. Participants with a score above 0.5 were categorised as having received more support than wanted (i.e., overprovision), those with a score below -0.5 were categorised as having received less support than wanted (i.e., underprovision), and those with a score between -0.5 and 0.5 were categorised as having congruence between wanted and received support (Shanock et al., 2010).

Polynomial regression analyses were conducted to test the effect of (in)congruence between wanted and received support on self-confidence, positive affect and negative affect respectively, and whether these effects were mediated by satisfaction with support. In order to reduce multicollinearity, received and wanted were scale-centred by subtracting the midpoint of each scale before calculating the second-order polynomial terms (i.e., received support^2, wanted support^2, and received X wanted support; Edwards, 2002; Shanock et al., 2010). Initially, five polynomial terms were entered into each regression analysis (one per outcome) as independent variables: received support, wanted support, received support^2, wanted support^2, and received X wanted support. An example of the SPSS syntax and formulas is presented in Appendix - III.

According to previous research (Edwards, 2002; Shanock et al., 2010), the coefficients of the five polynomial terms should be compounded to investigate the response surface pattern, instead of directly examining the results from the polynomial regression analysis. The response surface patterns can be graphed in a three-dimensional visual to demonstrate data with a more comprehensive perspective (Edwards, 2002; Shanock et al., 2010). Response surface graphs were plotted using

compound coefficients, which were also examined for statistical significance using 95% confidence intervals calculated via 10,000 bootstrapped resamples (Edwards, 2002; Shanock et al., 2010). The response surface patterns are represented by the slope and curvature of the perfect congruence line (received support = wanted support) and perfect incongruence line (received support = -wanted support), respectively (Edwards, 2002; Shanock et al., 2010). More specifically, the slope of the line of congruence focuses on whether there is a linear relationship between congruence of wanted and received support and outcomes at different levels of wanted and received support. The curvature of the line of congruence focuses on whether there is a non-linear relationship between congruence of wanted and received support and outcomes. The slope of the line of incongruence focuses on how the direction of the discrepancy, such as whether overprovision (received support > wanted support) or underprovision (received support < wanted support) is a more important predictor to outcomes. The curvature of the line of incongruence focuses on whether the outcomes are influenced as the degree of discrepancy between wanted and received support increases.

To examine whether satisfaction with support mediated the effects of (in)congruence between wanted and received support on outcomes, four further polynomial regressions were conducted (Edwards, n.d.-a). First, the above polynomial regression model was re-run but substituting satisfaction with support in as the dependent variable. Second, the polynomial regression model was re-run again but adding satisfaction with support as an independent variable and each outcome (i.e., self-confidence, positive affect and negative affect) as the dependent variable in turn. The indirect effect of each independent variable on outcomes via satisfaction was calculated as a product of the coefficient of each variable on satisfaction (i.e.,

first stage) and the coefficient of satisfaction predicting the outcome when satisfaction was included alongside the independent variables (i.e., second stage). An example of the SPSS syntax and formulas is presented in Appendix - III. For each set of compound coefficients in the total and direct effects models, the percentile method was used to determine the confidence intervals (Edwards, 2002). As compound coefficients representing indirect effects are typically not normally distributed, we tested the significance of the indirect effects by using bias-corrected confidence intervals constructed from estimates based on 10,000 bootstrap samples (Edwards & Cable, 2009; Efron & Tibshirani, 1993; Mackinnon, Lockwood, & Williams, 2004).

Results

Table 7 reports the means, standard deviations, and correlations between the variables for both samples. The correlations for British sample are presented below the diagonal, whereas the correlations for Chinese sample are presented above the diagonal. A series of independent-samples t-test found that British athletes wanted [$t_{(499)} = -2.54$, $p = .01$, $d = .23$] and received [$t_{(499)} = -2.38$, $p = .02$, $d = .21$] less support than Chinese athletes. There was no statistically significant difference in satisfaction with support [$t_{(499)} = 1.67$, $p = .10$, $d = .15$]. Further, British athletes reported higher self-confidence [$t_{(499)} = 3.89$, $p < .001$, $d = .35$] and positive affect [$t_{(499)} = 5.86$, $p < .001$, $d = .52$], and lower negative affect [$t_{(499)} = -3.28$, $p < .005$, $d = .29$].

Table 8 shows the percentage of athletes within each category (adequate support, underprovision and overprovision) and their means of wanted and received support in both samples. More than half of the participants in both samples experienced congruence between wanted and received support.

Table 7
Means, standard deviations, and correlations among variables

		British sample		*Chinese sample*							
	Variable	*M*	*SD*	*M*	*SD*	1	2	3	4	5	6
1	Wanted Support	2.59	0.80	2.76	0.78	-	.57**	.08	.08	.05	.33**
2	Received Support	2.54	0.84	2.71	0.77	.42**	-	.53**	.48**	.47**	-.15
3	Satisfaction with support	4.14	1.06	3.99	1.03	-0.03	.53**	-	.61**	.59**	-.45**
4	Self-confidence	2.87	0.66	2.64	0.71	.01	.51**	.53**	-	.72**	-.35**
5	Positive Affect	3.06	0.87	2.62	0.77	.01	.47**	.47**	.59**	-	-.34**
6	Negative Affect	1.64	0.75	1.85	0.70	.40**	-.07	-.36**	-.40**	-.34**	-

Note. $N_{British\ sample} = 236$. $N_{Chinese\ sample} = 265$. The correlations for British sample are presented below the diagonal, whereas the correlations for Chinese sample are presented above the diagonal. * $p < .05$** $p < .01$.

Table 8

Frequencies of athletes who experienced overprovision, underprovision, or adequate support in each sample

	British sample			Chinese sample		
Congruence groups	Percentage	Mean Received Support	Mean Wanted Support	Percentage	Mean Received Support	Mean Wanted Support
Overprovision	24.2	3.23	2.27	20.8	3.20	2.40
Adequate support	52.1	2.40	2.39	61.5	2.70	2.70
Underprovision	23.7	2.17	3.32	17.7	2.20	3.42

Note. $N_{British\ sample} = 236$. $N_{Chinese\ sample} = 265$.

Overprovision: Received support was more than 0.5 *SD*s larger than wanted support.

Adequate support: The standardised difference between received and wanted support was between -0.5 and 0.5.

Underprovision: Received support was more than 0.5 *SD*s lower than wanted support.

British Sample

Self-confidence. The total, direct, and indirect effect of each polynomial term and surface test of support (in)congruence on self-confidence are presented in Table 9. The total effects model explained 36% of variance on self-confidence. The slope of the line of congruence (wanted support = received support) was significant and positive, indicating that when individuals received the same amount of support that they wanted, self-confidence was greater at high levels of wanted and received support than lower levels (see Figure 6). This total effect comprised significant direct and indirect effects, indicating that congruency between wanted and received support influenced self-confidence directly as well as through increased satisfaction with support. The curvature of the line of congruence was not statistically significant.

The curvature of the line of incongruence was significant and negative, indicating that as the discrepancy between wanted and received support increased, self-confidence decreased. The direct and indirect effects for the curve of incongruence were both significant and negative, indicating that the discrepancy between wanted and received support influenced self-confidence directly as well as via decreased satisfaction with support. The slope of the line of incongruence (wanted support = -received support) was significant and positive indicating that individuals who received more support than they wanted (i.e., overprovision) had higher self-confidence compared to those who wanted more support than they received (i.e., underprovision). The direct and indirect effect were both significant and positive, indicating that the direction (overprovision or underprovision) of discrepancy influenced self-confidence directly as well as through satisfaction with support.

Table 9

Polynomial regression of wanted and received support on satisfaction and outcomes in the British sample

Variables	Satisfaction	Self-confidence			Positive Affect			Negative Affect		
		Total effect	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect
Constant	4.52***	3.12***	2.39***	.72**	3.33***	2.50***	.83**	1.61***	2.27***	-.66**
Received support	.76***	.49***	.37***	.12**	.63***	.49***	.14**	-.35**	-.24**	-.11**
Wanted support	-.39***	-.22***	-.16**	-.06**	-.29***	-.22**	-.07**	.41**	.35***	.06**
Received support ^{2}	-.26**	-.08	-.04	-.04**	-.03	.02	-.05**	.12*	.08	.04**
Received X Wanted support	.23**	.16**	.13*	.04**	.17*	.13	.04	-.38***	-.35***	-.03*
Wanted support ^{2}	-.08	-.14*	-.13*	-.01	-.20**	-.18**	-.02	.13*	.12*	.01
Satisfaction with support			.16***			.18**			-.15**	
R^2	.41	.36	.40		.30	.33		.36	.39	
Surface tests										
Congruence line										
Slope	.37***	.27***	.21***	.06***	.34***	.27***	.07***	.06	.11	-.05***
Curvature	-.12	-.06	-.04	-.01	-.06	-.04	-.03*	-.13**	-.15**	.02
Incongruence line										
Slope	1.15***	.71***	.53***	.18***	.92***	.71***	.21***	-.76***	-.59**	-.17***
Curvature	-.56***	-.38***	-.30***	-.09***	-.40***	-.30**	-.11***	.63***	.55**	.08***

Note. $N = 236$. Unstandardised regression coefficients are reported.

* $p < .05$, ** $p < .01$, *** $p < .001$.

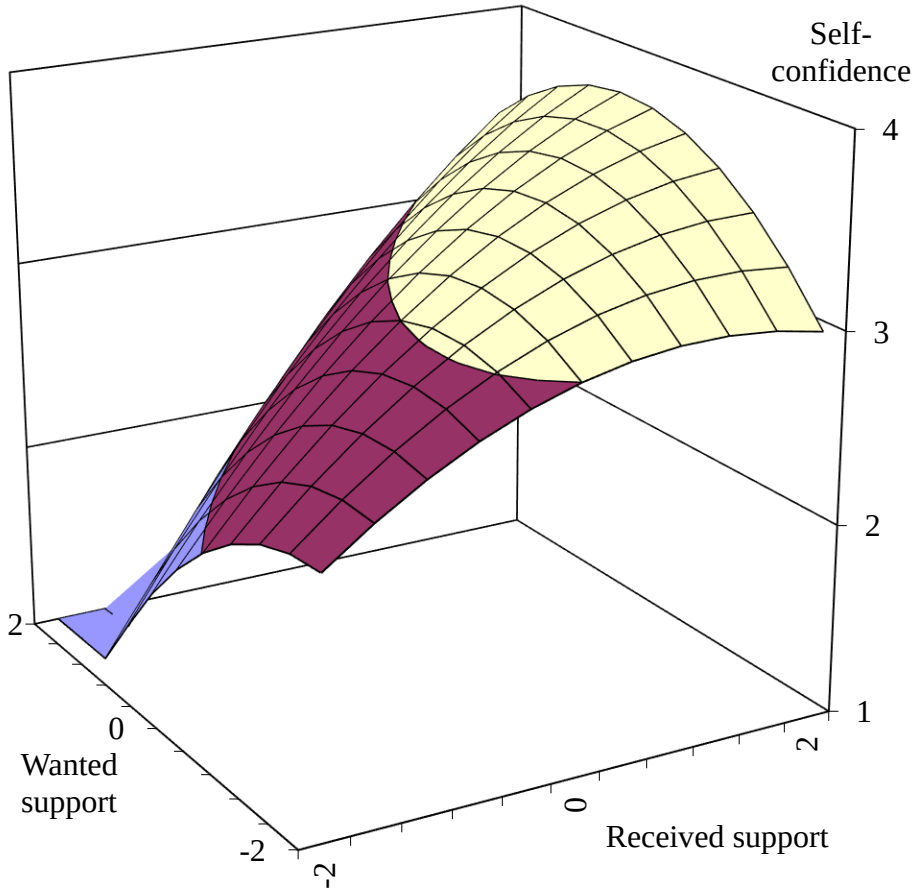

Figure 6. The response surface plot of wanted and received support predicting self-confidence in British athletes.

Positive affect. The total, direct, and indirect effect of each polynomial term and surface tests of support (in)congruence on positive affect are presented in Table 9. The total effects model explained 30% of the variance in positive affect. There was a significant and positive slope along the line of congruence between wanted and received support on positive affect, indicating that when individuals' wanted and received support were in agreement, positive affect was higher at high levels of wanted and received support than at lower levels (see Figure 7). The direct and indirect effect were both significant and positive, indicating that congruence between wanted and received support influenced positive affect directly as well as through increased satisfaction with support. The total and direct effect of curvature of the line of congruence were both not statistically significant, but its indirect effect was negatively associated with positive affect.

The curvature of the line of incongruence was significant and negative, indicating that as the discrepancy between wanted and received support increased, positive affect decreased. The direct and indirect effect were both significant and negative, indicating that discrepancy between wanted and received support predicted positive affect directly as well as through the support satisfaction. The slope of the line of incongruence was significant and positive, indicating that positive affect was higher for individuals who received overprovision rather than underprovision of support. The direct and indirect effect were both significant and positive, indicating that the direction of discrepancy influenced positive affect directly as well as through satisfaction with support.

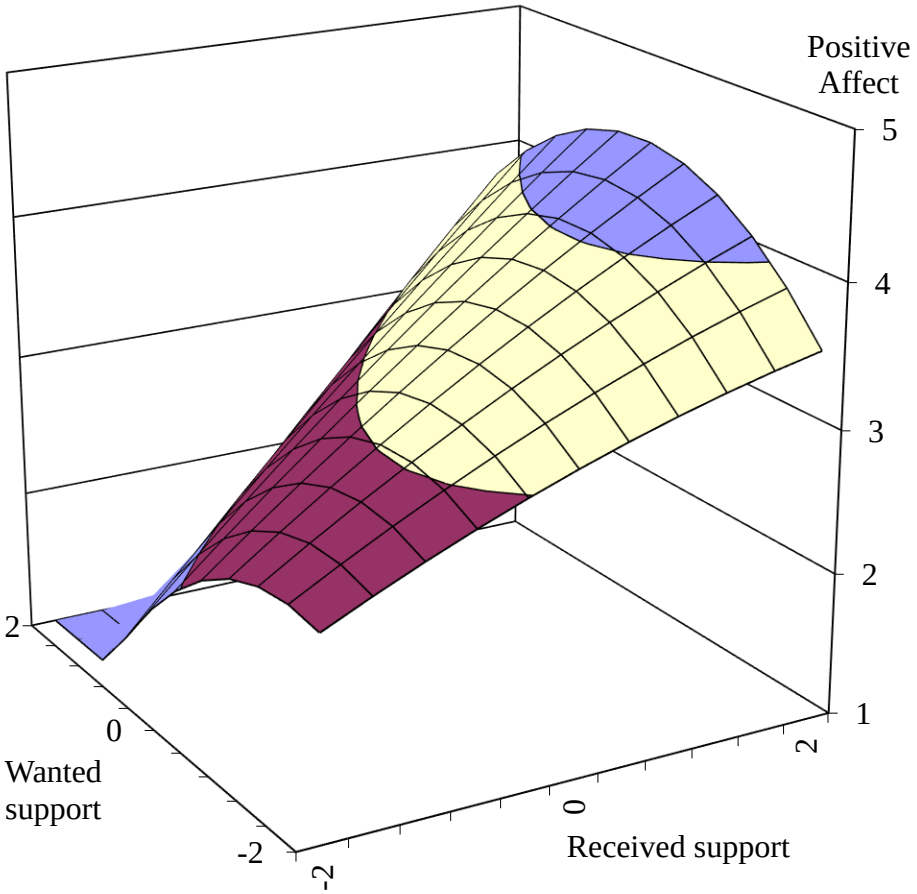

Figure 7. The response surface plot of wanted and received support predicting positive affect in British athletes.

Negative affect. The total, direct, and indirect effect of each polynomial term and surfaces tests for support (in)congruence on negative affect are presented in Table 9. The total effects model explained 36% of the variance in negative affect. The total and direct effects of the slope of the line of congruence were both not statistically significant, but the indirect effect was negatively related to the negative affect. Additionally, the total and direct effects of the curvature of the line of congruence were both negatively related to the negative affect (see Figure 8).

The curvature of the line of incongruence was significant and positive, indicating that as discrepancy between wanted and received support increased, negative affect also increased. The direct and indirect effects were both significant and positive, indicating that discrepancy influenced negative affect directly as well as indirectly through satisfaction. The slope of the line of incongruence was significant and negative, indicating that individuals who experienced overprovision had lower negative affect than those who experienced underprovision. The direct and indirect effect were both significant and negative, indicating that the direction of discrepancy between wanted and received support influenced negative affect directly as well as indirectly through satisfaction with support.

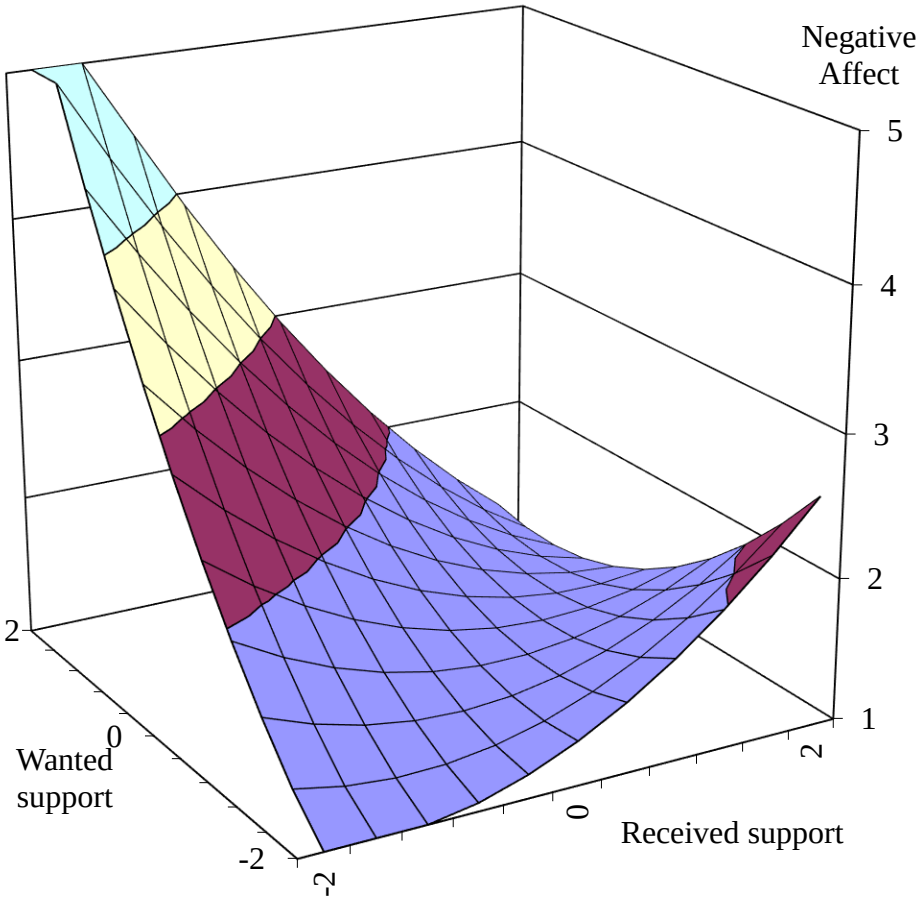

Figure 8. The response surface plot of wanted and received support predicting negative affect in British athletes.

Chinese Sample

Self-confidence. The total, direct, and indirect effect of each polynomial term and surface tests of support (in)congruence on self-confidence are presented in Table 10, along with their effects on satisfaction with support. The total effects model explained 31% of variance on self-confidence. The slope of the line of congruence was significant and positive, indicating that when individuals received the same amount of support that they wanted, self-confidence was greater at high levels of wanted and received support than lower levels (see Figure 9). This total effect comprised significant direct and indirect effects, indicating that congruence between wanted and received support influenced self-confidence directly as well as through increased satisfaction with support. The total and direct effects of the curvature of the line of congruence were both not statistically significant, but its indirect effect was negatively associated with self-confidence.

The curvature of the line of incongruence was significant and negative, indicating that as the discrepancy between wanted and received support increased, self-confidence decreased. The direct and indirect effects for the curve of incongruence were both significant and negative, indicating that discrepancy between wanted and received support influenced self-confidence directly as well as via decreased satisfaction with support. The slope of the line of incongruence was significant and positive indicating that individuals who experienced overprovision had higher self-confidence than those who experienced underprovision. The direct and indirect effect were both significant and positive, indicating that the direction of discrepancy influenced self-confidence directly as well as through satisfaction with support.

Table 10

Polynomial regression of wanted and received support on satisfaction and outcomes in the Chinese sample

Variables	Satisfaction	Self-confidence			Positive Affect			Negative Affect		
		Total effect	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect
Constant	4.29***	2.82***	1.52***	1.30***	2.85***	1.59***	1.26**	1.78***	2.73***	-.95**
Received support	.83***	.53***	.27***	.25**	.57***	.33***	.24**	-.36***	-.18**	-.18**
Wanted support	-.41***	-.21**	-.08	-.12**	-.28***	-.16**	-.12**	.44***	.35***	.09**
Received support ^{2}	-.33**	-.15*	-.05	-.10***	-.18**	-.08	-.10**	.28***	.21***	.07**
Received X Wanted support	.07	.18*	.16*	.02	.18*	.15*	.02	-.35***	-.33***	-.02
Wanted support ^{2}	.05	-.08	-.09	.02	-.11	-.12	.02	.03	.05	-.02
Satisfaction with support			.30***			.29***			-.22***	
R^2	.40	.31	.43		.32	.41		.37	.43	
Surface tests										
Congruence line										
Slope	.42***	.32***	.19***	.13***	.29***	.17**	.12***	.08	.17***	-.09***
Curvature	-.21*	-.05	.02	-.06*	-.11	-.05	-.06**	-.04	-.08	.04
Incongruence line										
Slope	1.24***	.74***	.35***	.37***	.85***	.49***	.36***	-.80***	-.53***	-.27***
Curvature	-.35**	-.41***	-.30**	-.10**	-.47***	-.35***	-.10**	.66***	.58***	.08**

Note. $N = 265$. Unstandardised regression coefficients are reported.

* $p < .05$, ** $p < .01$, *** $p < .001$.

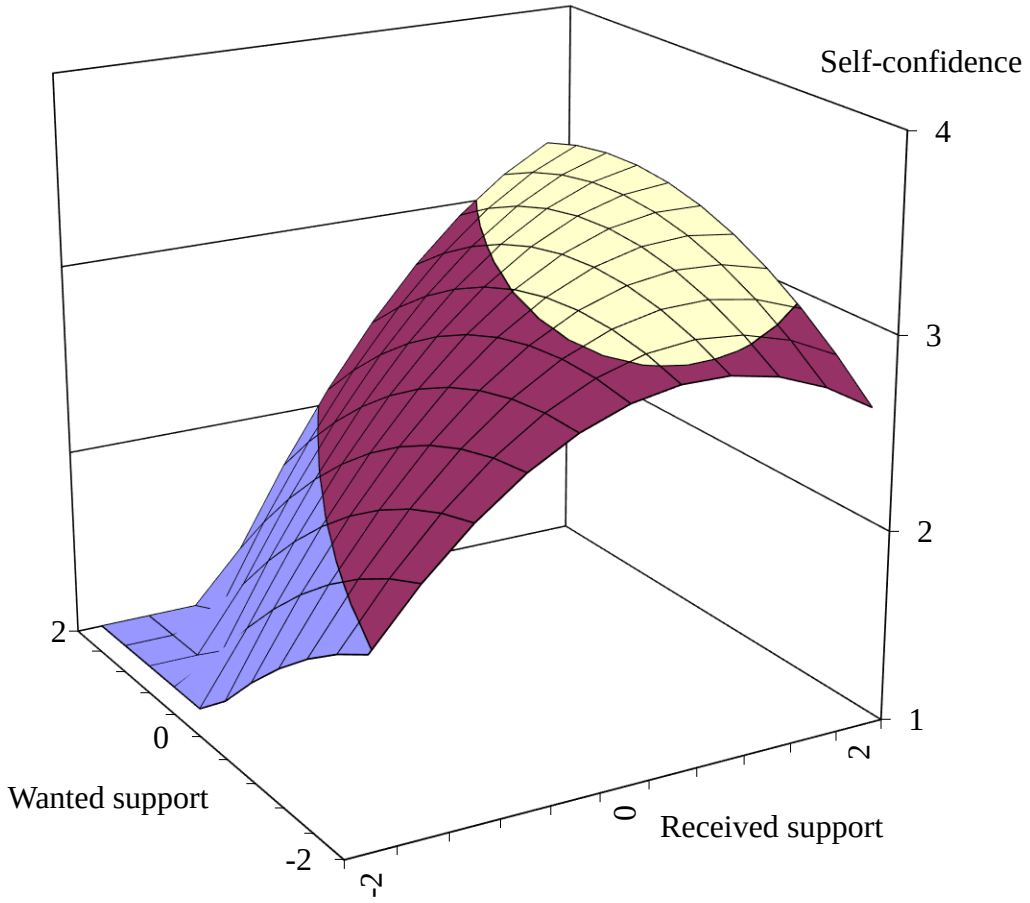

Figure 9. The response surface plot of wanted and received support predicting self-confidence in Chinese athletes.

Positive affect. The total, direct, and indirect effects of each polynomial term and surface tests of support (in)congruence on positive affect are presented in Table 10. The total model explained 32% of the variance in positive affect. There was a significant and positive slope along the line of congruence between wanted and received support on positive affect, indicating that when individuals' wanted and received support were in agreement, positive affect was higher at high levels of wanted and received support than lower levels (see Figure 10). The direct and indirect effect were both significant and positive, indicating that congruence between wanted and received support influenced positive affect directly as well as via increased satisfaction with support. The total and direct effects of the curvature of the line of congruence were both not statistically significant, but its indirect effect was negatively associated with positive affect.

The curvature of the line of incongruence was significant and negative, indicating that as the discrepancy between wanted and received support increased, positive affect decreased. The direct and indirect effect were both significant and negative, indicating that discrepancy influenced positive affect directly as well as through satisfaction with support. The slope of the line of incongruence was significant and positive, indicating that positive affect was higher for individuals who received overprovision rather than underprovision of support. The direct and indirect effect were both significant and positive, indicating that the direction of discrepancy influenced positive affect directly as well as through satisfaction with support.

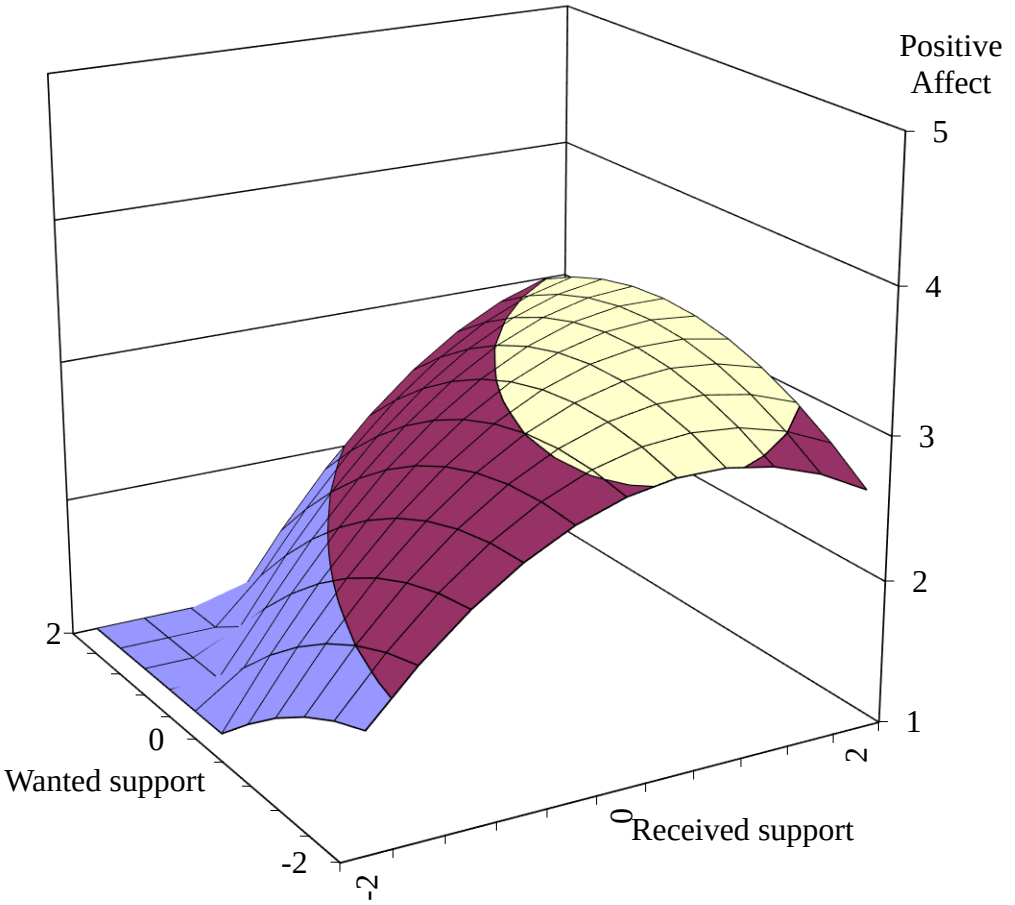

Figure 10. The response surface plot of wanted and received support predicting positive affect in Chinese athletes.

Negative affect. The total, direct, and indirect effect of each polynomial term on negative affect is presented in Table 10. The total model explained 37% of the variance in negative affect. The total effect of slope and curvature of the line of congruence were both not statistically significant. When individuals received adequate support, negative affect was consistently low regardless of the levels of support (see Figure 11).

The curvature of the line of incongruence was significant and positive, indicating that as discrepancy between wanted and received support increased, negative affect increased. The direct and indirect effects were both significant and positive, indicating that discrepancy between wanted and received support influenced negative affect directly as well as indirectly through satisfaction with support. The slope of the line of incongruence was significant and negative, indicating that individuals who experienced overprovision reported lower negative affect than those who experienced underprovision. The direct and indirect effect were both significant and negative, indicating that the direction of discrepancy between wanted and received support influenced negative affect directly as well as indirectly through satisfaction with support.

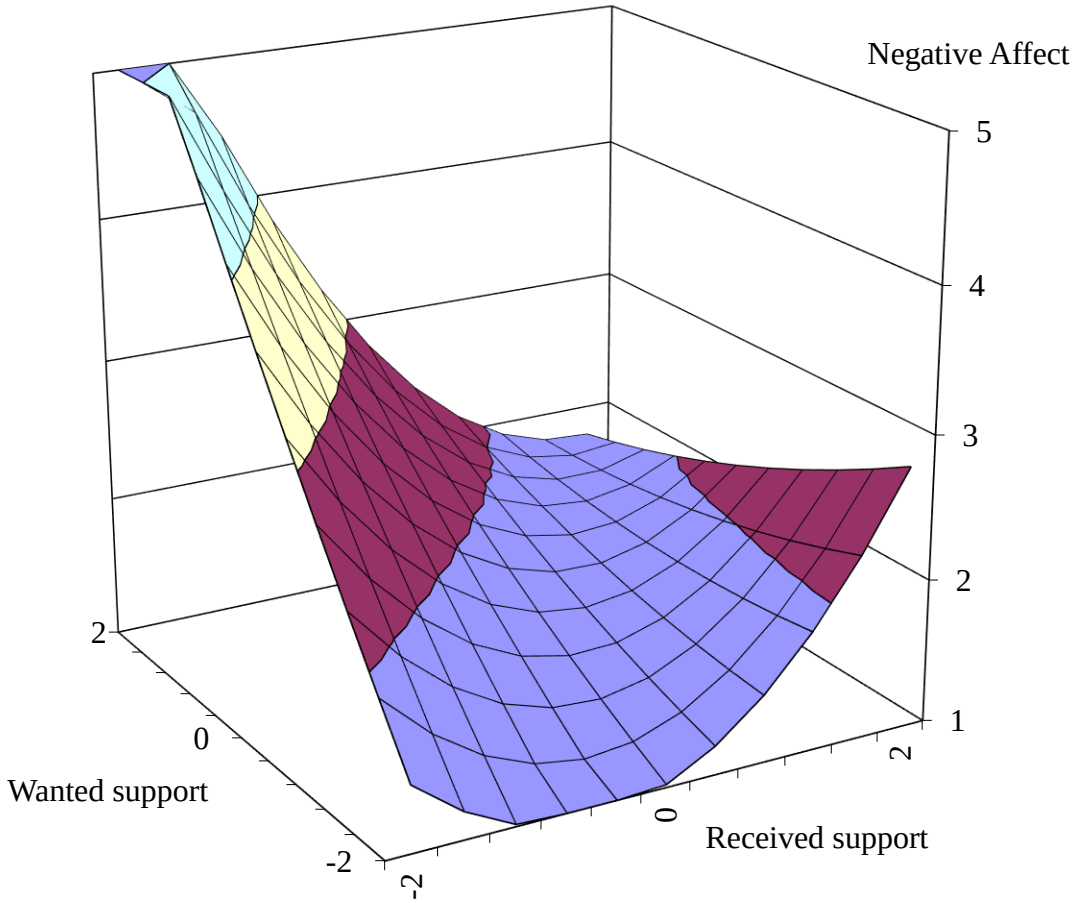

Figure 11. The response surface plot of wanted and received support predicting negative affect in Chinese athletes.

Discussion

The present study examined the support (in)adequacy model in sport to provide important insight into whether congruence between wanted support and received support influences well-being, and whether satisfaction with support mediates these effects among British and Chinese athletes. Although the Chinese athletes wanted and received more support than British athletes, the findings in both samples were largely consistent with the support adequacy model and highlight the important insights that can be gained by using polynomial regression with response surface methodology. More specifically, across both samples: 1) athletes experienced better self-confidence and positive affect (but not negative affect) when they received adequate support (received = wanted), especially at higher levels of received and wanted support; 2) athletes experienced worse self-confidence affect (both positive and negative) when wanted and received support were not congruent; 3) athletes experienced better self-confidence and affect when they experienced overprovision of support rather than underprovision; 4) support (in)adequacy predicted self-confidence and affect indirectly through satisfaction with support.

The current findings within a sporting context are broadly consistent with evidence for the beneficial effects of congruency between received and wanted support in organisational settings (Beehr et al., 2010; Seiger & Wiese, 2011), in couples (Brock & Lawrence, 2008, 2009, 2014; Dehle et al., 2001), people across different cultures (Barden et al., 2016) and patients with physical and mental disease (Koenders et al., 2015; Linden & Vodermaier, 2012; Reynolds & Perrin, 2004). Applying polynomial regression with response surface methodology, however, has provided a more comprehensive insight into how individuals' wanted and received support operates in an interactive and nonlinear manner to predict psychological

outcomes self-confidence and affect). In addition to the overall finding that adequate support was associated with favourable outcomes (e.g., Bar-Kalifa & Rafaeli, 2013), our findings highlight that individuals who wanted and received high support reported greater self-confidence and positive affect than those who wanted and received low support.

In line with previous evidence that discrepancy between wanted and received support is harmful to well-being (e.g., Joseph et al., 2016), the present study found a consistent pattern that individuals who reported greater discrepancy between wanted and received support reported poorer well-being. Brock and Lawrence (2009), however, argued that inadequate support should be divided into two distinct forms: underprovision and overprovision of support. More specifically, underprovision of support has generally been associated with unfavourable outcomes in previous research (e.g., Siewert et al., 2011). Our findings had a similar pattern with individuals who reported receiving less support than they wanted also reporting lower self-confidence and positive affect, and higher negative affect. Evidence for the impact of overprovision on well-being is more varied in the literature. For example, although some research has found that overprovision of support leads to superior outcomes (e.g., Siewert et al., 2011; Wolff et a., 2013), it is sometimes ineffective (Bar-Kalifa & Rafaeli, 2013), and even detrimental (Brock & Lawrence, 2009; Reynolds & Perrin, 2004). In the present study, individuals who received more support than they wanted reported better well-being than those who received less support than they wanted, which supports the notion that overprovision of support is less detrimental to well-being. Siewert et al. (2011) suggested that negative associations between overprovision and well-being may be more prevalent in individuals dealing with more stressful situation (e.g., breast cancer patients:

Reynolds & Perrin, 2004).

The current study found that (in)congruency between wanted and received support influenced outcomes through satisfaction with support. The findings extend the support adequacy model, and addressed calls in the literature to identify mechanisms through which social support exerts beneficial effects (Sarason & Sarason, 2009; Thoits, 2011). Specifically, individuals whose level of received support was congruent with what they wanted, reported greater satisfaction with support and in turn greater self-confidence and positive affect. This finding is similar to the perceived responsiveness theory, which suggests that perceptions of responsiveness to needs lead to improved satisfaction between support recipients and providers (Lemay, Clark, & Feeney, 2007). When support is highly responsive to individuals' needs, then support should be beneficial; however, if support is low in responsiveness, individuals experience poorer outcomes (Maisel & Gable, 2009). Further, perceived responsiveness has been found to mediate the harmful effects of underprovision on well-being (Bar-Kalifa & Rafaeli, 2013).

The current study found that Chinese athletes reported higher levels of wanted and received support than British athletes, which is different to previous findings that Asian populations reported less support use than European populations (Taylor et al., 2004; Wang et al., 2010). One potential reason is that currently in China, sport-related organisations, such as universities and governing bodies (e.g., Whole-Nation system) have contributed to the competitive athletes achieving better performance through different resources (Si, Duan, Li, & Jiang, 2011). Therefore, athletes may want more support, and members from the athletes' support network may have provided increased support, in order to fulfil the collective benefit and honour (Si et al., 2011). Despite the differences between the Chinese and British samples in the levels of

wanted and received support, the effects of support (in)adequacy were consistent across both cultures.

The current study has some important theoretical and methodological implications for social support research, and particularly the support adequacy model. First, this study translated the ARSQ (Freeman et al., 2014) into Chinese. In line with the Japanese version of ARSQ (ARSQ-J) (Katagami & Tsuchiya, 2016, 2017), the ARSQ-C had good content validity with Chinese athletes. The ARSQ-C may not only make a contribution to the future sports psychology research in China, but has also addressed the call of Kim et al. (2008) for more studies to examine culture differences in social support research. The current findings suggest that the ARSQ is a robust instrument that appears to work well across the cultures. Second, the consistency of relationships observed across the two samples suggests that the predictions of the support adequacy may generalise across cultures. Indeed, limited research has investigated underprovision and adequate support among Asians and, therefore, the findings have provided a more comprehensive understanding of these issues in an Eastern culture. Third, the ability to distinguish between differences in adequate support at high levels of wanted and received support versus low levels, to identify non-linear relationships, and to highlight satisfaction as a mechanism through which (in)congruent support impacts upon wellbeing has provided a more nuanced understanding of the support adequacy model. In this regard, polynomial regression with response surface graphs holds great promise. This is true not only for social support, but researchers interested in the impact of (in)congruency between other variables. For example, by applying a polynomial regression with response surface analysis, Stein, Bloom, and Sabiston (2012) found that (in)congruence of preferred and actual coaches' feedback styles influences motivational change.

The current findings also have important practical implications for athletes and their support personnel. It has been noted that some athletes consider wanting support may lead other people to see them as weak (Pensgaard & Roberts, 2003). The current findings highlighted that wanting high levels of support could be associated with superior outcomes, if correspondingly high levels of support are received. Indeed, congruency was associated with better outcomes at high levels of wanted and received support compared to lower levels. Athletes should therefore be educated that wanting and receiving support from others can be beneficial to their performance-related outcomes (e.g., self-confidence). Importantly, athletes' significant others such as their parents and coaches should be helped to recognise the support that athletes want are to tailor their support provision accordingly.

Although the present study found that (in)congruence between wanted and received support predicted well-being, one limitation is that the cross-sectional and correlational design limits the ability to determine causality (Hayes, 2013). This may explain why the current findings regarding overprovision of support differed from some research (Brock & Lawrence, 2009; Silverstein et al., 1996). Those studies used longitudinal designs and found that overprovision was beneficial to well-being at beginning, but harmful after a period of time. As such, examining the support adequacy model among athletes using longitudinal design would be an important avenue for future research. Further, the current study did not investigate whether individuals actually requested the support (Bolger & Amarel, 2007). Some studies have found that receiving unsolicited support is beneficial to well-being, such as increased positive emotions and feelings of competence (Morling et al., 2015), but requesting support has been categorised as an adaptive coping strategy because the supportive behaviours can be more tailored to individuals' needs (Thoits, 1986,

2011). In sports contexts, athletes may be less likely to request support even though they may want it, as they may wish to avoid highlighting their inability to manage situational demands to their support providers (e.g., coach) (Pensgaard & Roberts, 2003). Future research should therefore examine if requested support moderates the effects of (in)congruency between wanted and received support on well-being.

In sum, the findings of the present study suggest that wanted and received support have an interactive effect on self-confidence and affect directly as well as via the satisfaction with support. The findings broadly support the support adequacy model, but polynomial regression with response surface analyses provided a more nuanced understanding than possible with a difference score or joint effect methodology. Overall, the study found that received support was associated with more favourable affect when it was congruent with what athletes wanted, these effects were partially mediated by support satisfaction, and these relationships were generally consistent across British and Chinese athletes, despite differences in the absolute amount of support each sample wanted and received.

Table 11
The aims and main findings of Chapter 3, and aim of Chapter 4

Chapter	Aim	Findings
3	• To investigate whether the support (in)adequacy influences psychological well-being and whether these effects operate indirectly via satisfaction with support using polynomial regression analyses. • To examine if the effects of support (in)adequacy are consistent across British and Chinese athletes.	• Chinese athletes wanted and received more support than British athletes, but the effects of support (in)adequacy were consistent across two cultures. • Athletes who received higher level of adequate support (high received = high wanted) experienced better self-confidence and positive affect compared to those received lower level of adequate support (low received = low wanted). • Increases in the discrepancy between wanted and received support were associated with poorer self-confidence, positive affect, and negative affect. • Athletes who received overprovision of support (received > wanted) experienced better self-confidence, positive affect, and negative affect compared to those who received underprovision of support (received < wanted). Satisfaction with support generally mediated the effects of support (in)adequacy on self-confidence, positive affect, and negative affect.
4	• To explore whether requesting support further impacts upon the influence of wanted and received support on psychological well-being, and whether these effects operate indirectly via satisfaction with support using polynomial regression analyses.	

Chapter 4: The Effects of Requested Support on (In)adequacy of Wanted and Received Support on Well-being Through Satisfaction with Support

Introduction

Unlike the universal benefits of perceived support, received support has more inconsistent effects on well-being and performance-related outcomes (e.g., Freeman et al., 2014; Uchino, 2009; for more details, see Chapter 1). To explain the inconsistent effects of received support, this thesis has drawn on the support adequacy model, which focuses on the amount of support individuals want compared to what they actually receive (Dehle et al., 2001; Priem & Solomon, 2015). The findings of Chapter 2 and Chapter 3 are in line with the previous literature that adequate support (receiving the same amount of support as wanted) is beneficial to outcomes (e.g., Siewert et al., 2011; for more details, see Chapter 1), whereas a discrepancy between wanted and received support is detrimental to outcomes. Specifically, underprovision (receiving less support than wanted) is detrimental, but the effects of overprovision (receiving more support than wanted) are mixed (e.g., Bar-Kalifa & Rafaeli, 2013; for more details, see Chapter 1).

Another factor that may moderate the effects of received support is whether support has actually been requested by the recipient (Bolger & Amarel, 2007; for more details, see Chapter 1). According to the theoretical framework by Bolger and Amarel (2007), individuals typically request support when they realise their situation is very difficult, therefore, high levels of requested support may reduce the potential costs of receiving support (e.g., a sense of overprotection) and particularly overprovision (Kuijer et al., 2000). Indeed, Bolger and Amarel (2007) proposed that received support should be more effective when individuals have decided to seek it instead of receiving unrequested support. For example, cancer patients reported lower depression when they requested greater amounts of social support, suggesting seeking support behaviours is an adaptive coping strategy (Walker et al., 2006). In contrast,

research has demonstrated that unrequested support can exert deleterious effects such as poorer psychological (e.g., Song & Chen, 2014) and physiological outcomes (e.g., Deelstra et al., 2003). Evidence for the impact of receiving unrequested support is mixed though. Specifically, unrequested support may be less detrimental to well-being when individuals have high needs for support, such as encountering unsolvable problems (Deelstra et al., 2003) or stressful situations (Song & Chen, 2014). However, these unsolvable or stressful situations may not represent individuals' actual desires for support (Cohen et al., 2000) and Morling et al. (2015) distinguished individuals' self-reported needs and the objective severity of the situation as two separated constructs. Moreover, individuals may not request for help when they want it, as they may feel embarrassed and disgraced (Mattson & Hall, 2011). Therefore, it is important to consider requested support alongside individuals' experience of wanted and received support. The role of (un)requested support may be particularly important to understand in sporting contexts because supportive exchanges between athletes and their support providers (e.g., coach) are often unsolicited (Rees & Freeman, 2012).

The primary aim of the current study was to investigate whether requested support further moderates the influence of wanted and received support on outcomes in sport. The secondary aim was to examine if satisfaction with support is a mechanism through which wanted, requested and received support influence outcomes. Based on the previous findings that matched support has been generally associated with better well-being (e.g., Siewert et al., 2011) but inadequate support is more harmful to well-being (e.g., Brock & Lawrence, 2009), we hypothesised that regardless of how much support individuals requested, adequate support would be associated with more favourable well-being than inadequate support. Further, well-

being would be particularly favourable at higher levels of matched wanted and received support compared to lower levels. We also hypothesised that regardless of how much support individuals requested, underprovision of support would be negatively related to well-being. Given the mixed findings of the effects of overprovision and requested support, we hypothesised the effects of overprovision on outcomes would change based on different levels of requested support. We further hypothesised that all of these effects would be partially mediated by satisfaction with support.

Method

Participants

Participants were 296 university athletes including 108 female and 188 male. The mean age was 21.67 years (*SD* = 3.32), and 75.7% were white, 3.0% were mixed, 15.9% were Asian, 2.7% were black, and 2.7% were another ethnic group. Participants had competed for a mean of 8.57 years (*SD* = 4.30) in 34 different sports (20 individual and 14 team sports) at club (*n* = 197), regional (*n* = 74), national (*n* = 20), or international (*n* = 5) level.

Procedures

This study was approved by a university ethics committee and participants provided informed consent. Participants were recruited at training sessions in a British university and they were asked to complete paper-and-pencil questionnaires. Data were collected at two-time points. One week before a competition, participants completed a measure of the support that they wanted to receive in the coming week along with measures of self-confidence and affect. One day before the same competition, participants completed a measure of the support that they had requested and received in the last week, along with a measure of satisfaction with support, and

the same measures of self-confidence and affect.

Measures

Received support. Received support was assessed using the same measure as Chapter 3 (See Appendix - IV).

Wanted support. Wanted support was assessed using the same measure as Chapter 3 (See Appendix - IV).

Requested support. Requested support was assessed using a revised version of ARSQ. Compared to the ARSQ, no modifications were made to the items or response options. The generic stem was modified to "In the last week, how often did you request people…" Participants were asked to indicate the frequency with which they requested each type of support from people during the last week ranging from *not at all* to *seven or more times* (coded 1-5 for analysis) (See Appendix - IV). The mean of the 22 items was calculated with higher scores reflecting higher levels of requested support.

Satisfaction. Satisfaction with support was assessed using the same measure as Chapter 3 (See Appendix - IV).

Self-confidence. Self-confidence was assessed using the same measure as Chapter 3 (See Appendix - IV).

Affect. Positive and negative affect were assessed using the same measure as Chapter 3 (See Appendix - IV).

Analyses

Following the recommendations of Shanock et al. (2010), the base rate of (in)congruence between wanted and received support was calculated, before we conducted the polynomial regression analyses. The scores of wanted and received support were standardised, and then difference scores were calculated by subtracting

standardised wanted support from standardised received support. Participants with a score above 0.5 were considered as receiving more support than wanted (i.e., overprovision), those with score below -0.5 were considered as receiving less support than wanted (i.e., underprovision), and those with a score between -0.5 and 0.5 were considered as experiencing congruence between wanted and received support (i.e., adequate support; Shanock et al., 2010). Hierarchical polynomial regression analyses were conducted to test whether the effect of (in)congruence between wanted and received support on self-confidence, positive affect, and negative affect was moderated by requested support, and whether these effects were mediated by satisfaction with support. In order to reduce multicollinearity, received and wanted support were scale-centred by subtracting the midpoint of each scale before calculating the second-order polynomial terms (i.e., received support^2, wanted support^2, and received X wanted support; Edwards, 2002; Shanock et al., 2010). Independent variables were then entered in three steps. At step 1, the outcome at time 1 was entered as a covariate. At step 2, five terms were entered: received support, wanted support, received support^2, wanted support^2, and received X wanted support. At step 3, six additional terms were entered: requested support, requested X received support, requested X wanted support, requested X received support^2, requested X received X wanted support, and requested X wanted support^2. An example of the SPSS syntax and formulas is presented in Appendix - IV. The moderating effect of requested support was tested by assessing the increment in R^2 at step 3 (Edwards, n.d.-b).

To examine whether satisfaction with support mediated the effects of wanted, received, and requested support on time 2 self-confidence, positive affect and negative effect, two further polynomial regressions were conducted (Edwards, n.d.-a).

First, the final polynomial regression model was re-run but substituting satisfaction with support in as the dependent variable. Second, the final polynomial regression model was re-run again but adding satisfaction with support in as an independent variable and time 2 outcomes as the dependent variable in turn. The indirect effect of each independent variable on time 2 outcomes via satisfaction was calculated as a product of the coefficient of each variable on satisfaction (i.e., first stage) and the coefficient of satisfaction predicting the time 2 outcome when satisfaction was included alongside the independent variables (i.e., second stage). An example of the SPSS syntax and formulas is presented in Appendix - IV. We tested the significance of the indirect effects by using bias-corrected confidence intervals constructed from estimates based on 10,000 bootstrap samples (Edwards & Cable, 2009; Efron & Tibshirani, 1993; Mackinnon et al., 2004).

To determine the form of the moderating effect of requested support for the total, direct and indirect effects, one standard deviation above and below the mean of requested support were substituted into the polynomial regression models to explore the simple quadratic functions at high and low levels of requested support, respectively. Rather than focusing on interpreting individual regression coefficients, response surface graphs were plotted using compound coefficients, which were also examined for statistical significance using bias-corrected 95% confidence intervals calculated via 10,000 bootstrapped resamples. The slope and curvature of the surface along wanted equals received support (the line of perfect congruence) were examined along with the slope and curvature of the surface along wanted equals the reciprocal of received support (the line of perfect incongruence). The slope of the line of congruence examined whether there was a linear relationship between agreement of wanted and received support and time 2 outcome. The curvature of the line of

congruence examined whether there was a non-linear relationship between agreement of wanted and received support and time 2 outcome. The slope of the line of incongruence examined whether the direction of the discrepancy (received more than wanted support or wanted more than received support) related to the time 2 outcome. The curvature of the line of incongruence examined whether the time 2 outcome was influenced as the degree of discrepancy between wanted and received support increased.

Results

Table 12 shows the percentage of participants within each category and the mean of received, wanted and requested support. More than half of the participants experienced congruence between wanted and received support, and the rest of them experienced receiving more or less support than wanted.

Table 13 reports means, standard deviations, and correlations between the variables. A large effect size was found for the correlations between requested and wanted support, satisfaction and time 2 outcomes, and self-confidence and affect. The other variables were either weakly or moderately correlated, including the relationship between outcomes at time 1 and time 2.

Table 12

Frequencies of participants who reported that received support was over, under, or equal with wanted support

Congruence groups	Percentage	Mean Received Support	Mean Wanted Support	Mean Requested Support
Overprovision	23.6	3.22	2.23	2.31
Adequate support	52.4	2.65	2.59	2.19
Underprovision	24.0	2.12	3.22	2.53

Note. $N = 296$.

Overprovision: Received support was more than 0.5 standard deviations greater than wanted support.

Adequate support: The standardised difference between received and wanted support was between -0.5 and 0.5.

Underprovision: Received support was more than 0.5 standard deviations less than wanted support.

Table 13
Means, standard deviations, and correlations among variables

	Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1	Time 1 Self-confidence	2.95	.65									
2	Time 1 Positive Affect	3.22	.74	.51**								
3	Time 1 Negative Affect	1.66	.57	-.28**	-.09							
4	Wanted Support	2.66	.82	-.04	.11	.28**						
5	Requested Support	2.30	.90	-.01	.16**	.25**	.62**					
6	Received Support	2.66	.84	.03	.14*	.23**	.47**	.47**				
7	Satisfaction	4.31	1.05	.09	.15*	-.18**	.02	-.12*	.19**			
8	Time 2 Self-confidence	2.97	.77	.41**	.28**	-.11	-.05	-.10	.17**	.55**		
9	Time 2 Positive Affect	3.23	.90	.27**	.43**	-.01	.10	.04	.35**	.53**	.72**	
10	Time 2 Negative Affect	1.85	.86	-.11	-.03	.37**	.24**	.40**	.08	-.58**	-.58**	-.44**

Note. $N = 296$. * $p < .05$, ** $p < .01$.

Self-confidence

Overall model. The total, direct, and indirect effect of each polynomial term on time 2 self-confidence are presented in Table 14, along with their effects on satisfaction with support. The total effects model explained 41% of variance on time 2 self-confidence. The (in)congruence effects between wanted and received support was moderated by requested support ($\Delta R^2 = .05$, $p < .001$). To further examine this effect, response surface graphs of total effect were plotted for the impact of (in)congruence of wanted and received support on time 2 self-confidence at low and high requested support. The mediation analysis was only conducted in the polynomial regression model in Step 3, therefore, the direct and indirect effect of each variable was only displayed in Step 3.

Table 14

Hierarchical polynomial regression: Effects of wanted, received, and requested support on satisfaction and time 2 self-confidence, after controlling for time 1 self-confidence

		Satisfaction	Time 2 Self-confidence		
Variables	R^2		Total effect	Direct effect	Indirect effect
Step 1	.17***				
Constant			1.54***		
Time 1 Self-confidence			.48***		
Step 2	.36***				
Constant			1.66***		
Time 1 Self-confidence			.49***		
Received support			.19**		
Wanted support			-.04		
Received support ^{2}			-.24***		
Received X Wanted support			.45***		
Wanted support ^{2}			-.13*		
Step 3	.41***				
Constant		4.93**	2.19***	.88**	1.31**
Time 1 Self-confidence		.16*	.48***	.44***	.04*
Received support		-.42	-.29	-.18	-.11
Wanted support		.64*	.38	.21	.17*
Received support ^{2}		-.69**	-.46**	-.27	-.18**
Received X Wanted support		1.28**	.65***	.31*	.34**
Wanted support ^{2}		-.21	-.24	-.18	-.06
Requested support		-.36***	-.21**	-.11	-.10**
Requested X Received support		.38***	.22**	.11	.10**
Requested X Wanted support		-.16	-.15*	-.11	-.04
Requested X Received support ^{2}		.18*	.10	.05	.05*
Requested X Received X Wanted support		-.35***	-.13*	-.04	-.09**
Requested X Wanted support ^{2}		.02	.07	.065	.005
Mediator					
Satisfaction with support				.27***	

Note. $N = 296$. Unstandardised regression coefficients are reported. * $p < .05$, ** $p < .01$, *** $p < .001$.

Surface values and graphs.

Low requested support. The total, direct, and indirect effects of (in)congruence between wanted and received support on time 2 self-confidence at low levels of requested support (one *SD* below mean), controlling for time 1 self-confidence, are shown in the Table 15. The total and direct effects of the slope of the line of congruence (wanted support = received support) were both not statistically significant, but its indirect effect was positively related to the time 2 self-confidence. The curvature of the line of congruence was not statistically significant (see Figure 12).

The slope of the line of incongruence (wanted support = -received support) was not statistically significant indicating that at low levels of requested support, individuals who received less support than they wanted (i.e., underprovision) had similar time 2 self-confidence to those who received more support than they wanted (i.e., overprovision). The curvature of the line of incongruence was significant and negative, indicating that when low levels of support were requested as the discrepancy between wanted and received support increased, time 2 self-confidence decreased. The direct and indirect effects for the curve of incongruence were both significant and negative, indicating that the discrepancy between wanted and received support influenced time 2 self-confidence directly as well as via decreased satisfaction with support.

Table 15
Received – wanted support (in)congruence predicting time 2 self-confidence when requested low levels of support (one SD below mean), after controlling for time 1 self-confidence

Predictor	Total Effect	Direct Effect	Indirect Effect
Constant	1.91***	.73***	1.18**
Time 1 Self-confidence	.48***	.44***	.04*
Received support	.01	-.02	.03
Wanted support	.17	.06	.11**
Received support ^{2}	-.32***	-.20**	-.12***
Received X Wanted support	.47***	.26**	.21***
Wanted support ^{2}	-.14	-.09	-.05
Surface tests			
Congruence line			
Slope	.18	.04	.14***
Curvature	.01	-.03	.04
Incongruence line			
Slope	-.16	-.08	-.08
Curvature	-.93***	-.55***	-.38***

Note. $N = 296$. Unstandardised regression coefficients are reported.
*$p < .05$, **$p < .01$, *** $p < .001$.

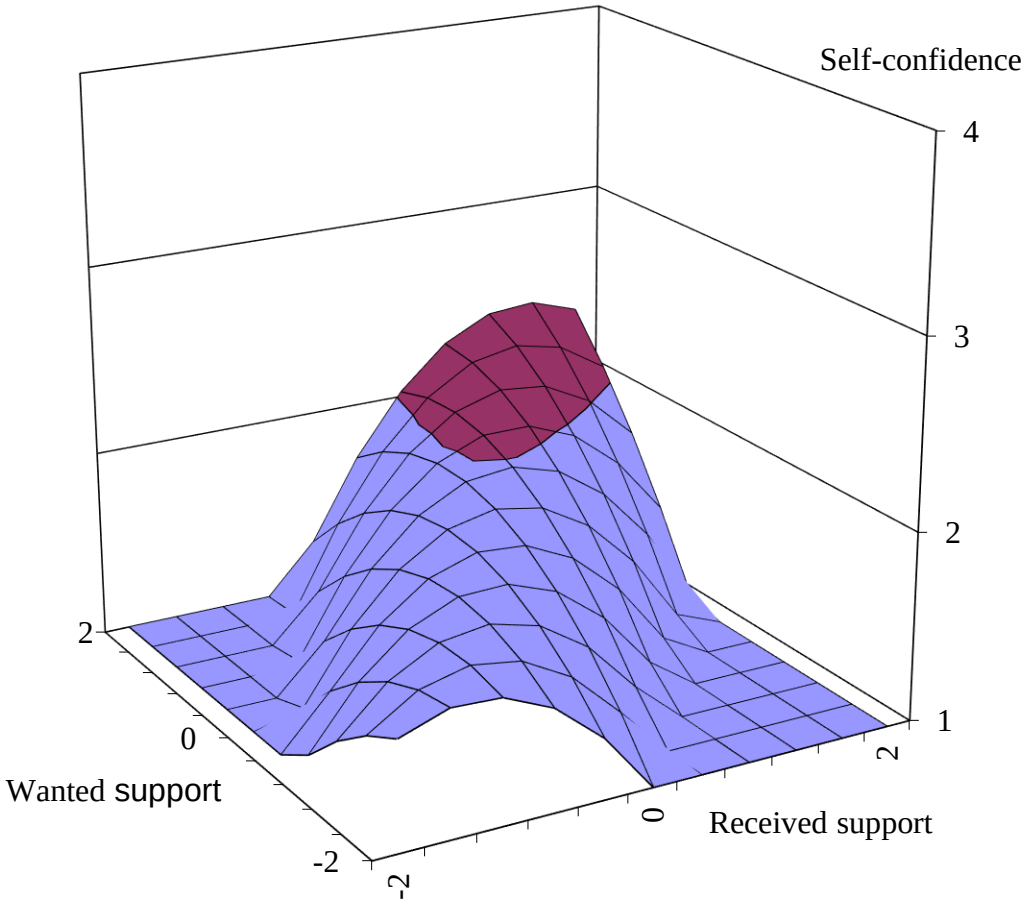

Figure 12. The response surface plot of wanted and received support predicting time 2 self-confidence at low levels of requested support, controlling for time 1 self-confidence.

High requested support. The total, direct, and indirect effects of (in)congruence between wanted and received support on time 2 self-confidence at high levels of requested support (one *SD* above mean), controlling for time 1 self-confidence, are shown in the Table 16. At high levels of requested support, the slope of the line of congruence was significant and positive, indicating that when an individual's wanted and received support were in agreement, time 2 self-confidence was greater at high levels of wanted and received support than lower levels (see Figure 13). Only the indirect effect was significant and positive, indicating that congruence predicted time 2 self-confidence indirectly through the support satisfaction rather than directly. The curvature of the line of congruence was not statistically significant.

At high requested support, the slope of the line of incongruence was significant and positive, indicating that time 2 self-confidence was lower when individuals received less support than they wanted compared to when they received more support than they had wanted. The direct and indirect effect were both significant and positive, indicating that the direction of discrepancy influenced time 2 self-confidence directly as well as through satisfaction with support. The curvature of the line of incongruence was significant and negative, indicating that when requested support was high as the discrepancy between wanted and received support increased, time 2 self-confidence decreased. The direct and indirect effects were both significant and negative, indicating that the degree of discrepancy influenced time 2 self-confidence directly as well as via decreased satisfaction with support.

Table 16
Received – wanted support (in)congruence predicting time 2 self-confidence when requested high levels of support (one SD above mean), after controlling for time 1 self-confidence

Predictor	Total Effect	Direct Effect	Indirect Effect
Constant	1.53***	.53**	1.00***
Time 1 Self-confidence	.48***	.44***	.04*
Received support	.40***	.19***	.21***
Wanted support	-.09	-.13*	.03
Received support ^{2}	-.15**	-.11	-.03
Received X Wanted support	.24**	.19*	.04
Wanted support ^{2}	-.01	.03	-.04*
Surface tests			
Congruence line			
Slope	.31***	.06	.24***
Curvature	-.08	.11	-.03
Incongruence line			
Slope	.49***	.32***	.18***
Curvature	-.40**	-.27*	-.11*

Note. $N = 296$. Unstandardised regression coefficients are reported.
*$p < .05$, **$p < .01$, *** $p < .001$.

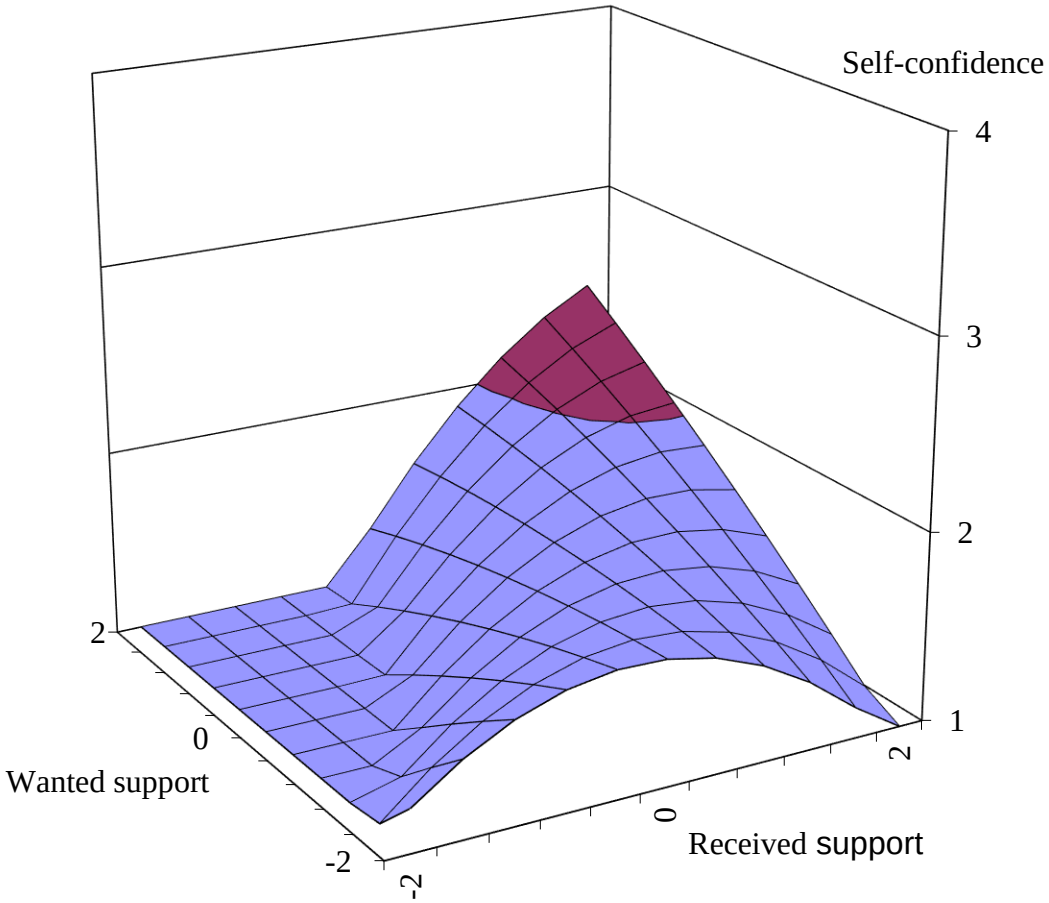

Figure 13. The response surface plot of wanted and received support predicting time 2 self-confidence at high levels of requested support, controlling for time 1 self-confidence.

Positive Affect

Overall model. The total, direct, and indirect effect of each polynomial term on time 2 positive affect are presented in Table 17, along with their effects on satisfaction with support. The total effects model explained 46% of variance on time 2 positive affect. The (in)congruence effects between wanted and received support was moderated by requested support ($\Delta R^2 = .05$, $p < .001$). To further examine this effect, response surface grants were plotted for the impact of (in)congruence of wanted and received support on time 2 positive affect at low and high requested support. The mediation analysis was only conducted in the polynomial regression model in Step 3, therefore, the direct and indirect effect of each variable was only displayed in Step 3.

Table 17

Hierarchical polynomial regression: Effects of wanted, received, and requested support on satisfaction and time 2 positive affect, after controlling for time 1 positive affect

		Satisfaction	Time 2 Positive Affect		
Variables	R^2		Total effect	Direct effect	Indirect effect
Step 1	.18***				
Constant			1.56***		
Time 1 Positive Affect			.52***		
Step 2	.41***				
Constant			1.92***		
Time 1 Positive Affect			.48***		
Received support			.33***		
Wanted support			-.04		
Received support ^{2}			-.28***		
Received X Wanted support			.46***		
Wanted support ^{2}			-.16**		
Step 3	.46***				
Constant		4.77***	2.38***	1.18***	1.19**
Time 1 Positive Affect		.21**	.48***	.43***	.05*
Received support		-.34	-.20	-.11	-.09
Wanted support		.67*	.67**	.51*	.17*
Received support ^{2}		-.69**	-.48**	-.32	-.17**
Received X Wanted support		1.32***	.69***	.36*	.33**
Wanted support ^{2}		-.19	.003	.05	-.05
Requested support		-.39***	-.17*	-.07	-.10**
Requested X Received support		.35**	.23**	.14	.09**
Requested X Wanted support		-.17	-.23**	-.19*	-.04
Requested X Received support ^{2}		.18*	.08	.04	.05
Requested X Received X Wanted support		-.36***	-.16*	-.07	-.09**
Requested X Wanted support ^{2}		.01	-.03	-.04	.004
Mediator					
Satisfaction with support				.25***	

Note. $N = 296$. Unstandardised regression coefficients are reported. * $p < .05$, ** $p < .01$, *** $p < .001$.

Surface values and graphs.

Low requested support. The total, direct, and indirect effects of (in)congruence between wanted and received support on time 2 positive affect at low levels of requested support (one *SD* below mean), controlling for time 1 positive affect, are shown in the Table 18. The slope of the line of congruence (wanted support = received support) was significant and positive, indicating that at low levels of requested support, when an individual's wanted and received support were in agreement, time 2 positive affect was greater at high levels of wanted and received support than lower levels (see Figure 14). This total effect combined significant direct and indirect effects, indicating that agreement between wanted and received support influenced time 2 positive affect directly as well as through increased satisfaction with support. The curvature of the line of congruence was not statistically significant. The slope of the line of incongruence (wanted support = -received support) was not statistically significant indicating that at low levels of requested support, individuals who wanted more support than they received (i.e., underprovision) had similar time 2 positive affect to those who received more support than they wanted (i.e., overprovision). The curvature of the line of incongruence was significant and negative, indicating that when low levels of support were requested as the discrepancy between wanted and received support increased, time 2 positive affect decreased. The direct and indirect effects for the curve of incongruence were both significant and negative, indicating that the discrepancy between wanted and received support influenced time 2 positive affect directly as well as via decreased satisfaction with support.

Table 18
Received – wanted support (in)congruence predicting time 2 positive affect when requested low levels of support (one SD below mean), after controlling for time 1 positive affect

Predictor	Total Effect	Direct Effect	Indirect Effect
Constant	2.14***	1.08***	1.06***
Time 1 Positive Affect	.48***	.43***	.05**
Received support	.13	.09	.04
Wanted support	.35**	.25	.11***
Received support ^{2}	-.38***	-.27***	-.11***
Received X Wanted support	.47***	.26**	.20***
Wanted support ^{2}	-.04	-.0003	-.04
Surface tests			
Congruence line			
Slope	.48***	.34**	.15***
Curvature	.05	-.01	.05
Incongruence line			
Slope	-.22	-.16	-.07
Curvature	-.89***	-.53***	-.35***

Note. $N = 296$. Unstandardised regression coefficients are reported.
*$p < .05$, **$p < .01$, *** $p < .001$.

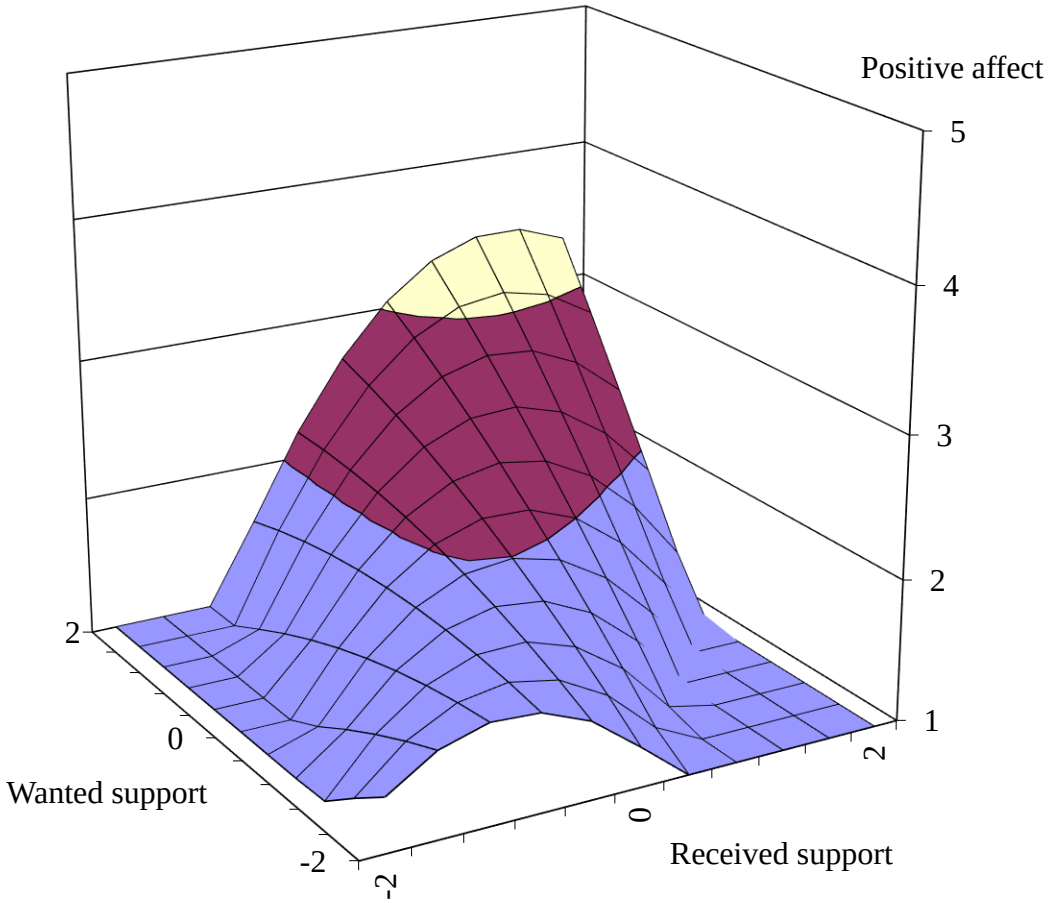

Figure 14. The response surface plot of wanted and received support predicting time 2 positive affect at low levels of requested support, controlling for time 1 positive affect.

High requested support. The total, direct, and indirect effects of (in)congruence between wanted and received support on time 2 positive affect at high levels of requested support (one *SD* above mean), controlling for time 1 positive affect, are shown in the Table 19. At high levels of requested support, the slope of the line of congruence was significant and positive, indicating that when an individual's wanted and received support were in agreement, time 2 positive affect was greater at high levels of wanted and received support than lower levels (see Figure 15). This total effect comprised significant direct and indirect effects, indicating that agreement between wanted and received support influenced time 2 positive affect directly as well as via increased satisfaction with support. The curvature of the line of congruence was not statistically significant.

At high requested support, the slope of the line of incongruence was significant and positive, indicating that time 2 positive affect was lower when individuals wanted more support than they received compared to when they received more support than they had wanted. The direct and indirect effect were both significant and positive, indicating that the direction of discrepancy influenced time 2 positive affect directly as well as through satisfaction with support. The curvature of the line of incongruence was significant and negative, indicating that when requested support was high as the discrepancy between wanted and received support increased, time 2 positive affect decreased. The direct and indirect effects were both significant and negative, indicating that the degree of discrepancy influenced time 2 positive affect directly as well as via decreased satisfaction with support.

Table 19
Received – wanted support congruence predicting time 2 positive affect when requested high levels of support (one SD above mean), after controlling for time 1 positive affect

Predictor	Total Effect	Direct Effect	Indirect Effect
Constant	1.83***	.94***	.88***
Time 1 Positive Affect	.48***	.43***	.05**
Received support	.54***	.35***	.20***
Wanted support	-.06	-.09	.03
Received support ^{2}	-.23***	-.20**	-.03
Received X Wanted support	.19	.14	.04
Wanted support ^{2}	-.10	-.07	-.04**
Surface tests			
Congruence line			
Slope	.48***	.26**	.23***
Curvature	-.14	-.13	-.03
Incongruence line			
Slope	.60***	.44***	.17***
Curvature	-.52***	-.41**	-.11**

Note. $N = 296$. Unstandardised regression coefficients are reported.
*$p < .05$, **$p < .01$, *** $p < .001$.

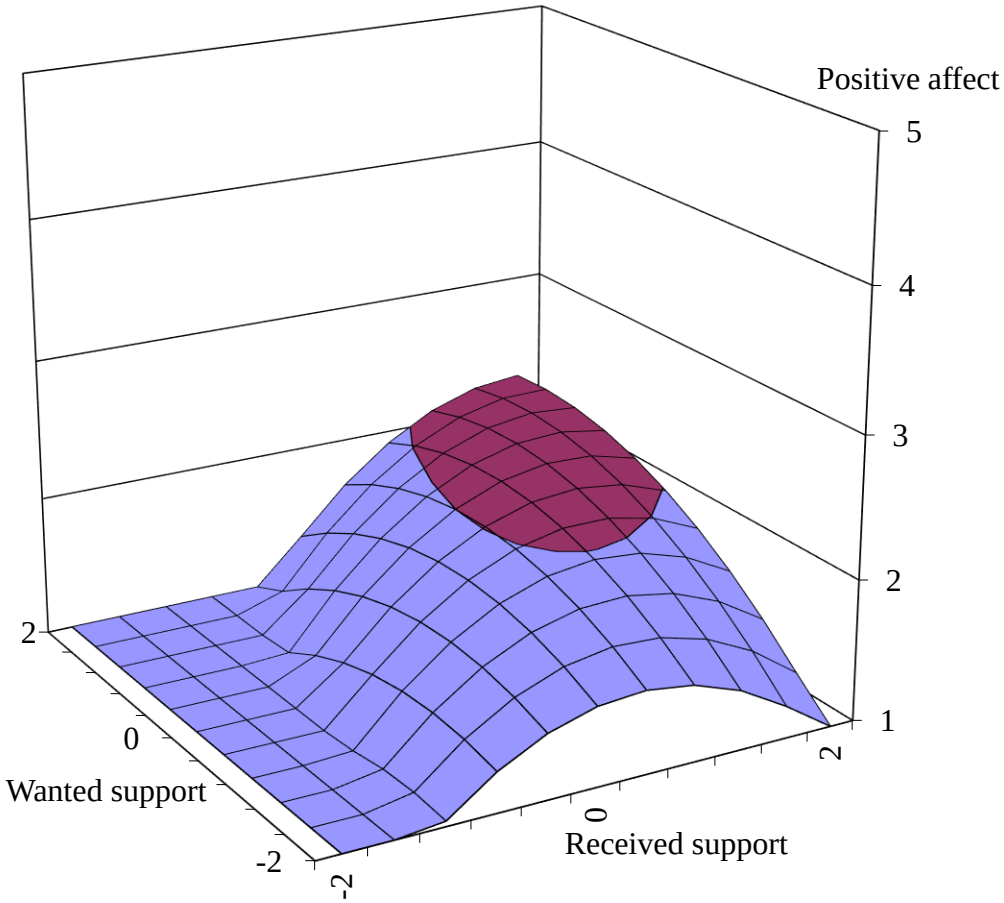

Figure 15. The response surface plot of wanted and received support predicting time 2 positive affect at high levels of requested support, controlling for time 1 positive affect.

Negative Affect

Overall model. The total, direct, and indirect effect of each polynomial term on time 2 negative affect are presented in Table 20. The total model explained 57% of the variance in time 2 negative affect. The (in)congruence effects between wanted and received support was moderated by requested support ($\Delta R^2 = .13$, $p < .001$). To further examine this effect, response surface graphs were plotted for the impact of (in)congruence of wanted and received support on time 2 negative affect at low and high requested support. The mediation analysis was only conducted in the polynomial regression model in Step 3, therefore, the direct and indirect effect of each variable was only displayed in Step 3.

Table 20

Hierarchical polynomial regression: Effects of wanted, received, and requested support on satisfaction and time 2 negative affect, after controlling for time 1 negative affect

		Satisfaction	Time 2 Negative Affect		
Variables	R^2		Total effect	Direct effect	Indirect effect
Step 1	.13***				
Constant			.93***		
Time 1 Negative Affect			.56***		
Step 2	.44***				
Constant			1.01***		
Time 1 Negative Affect			.42***		
Received support			-.07		
Wanted support			.07		
Received support ^{2}			.37***		
Received X Wanted support			-.68***		
Wanted support ^{2}			.17**		
Step 3	.57***				
Constant		5.82***	.25	1.77***	-1.51**
Time 1 Negative Affect		-.26**	.35***	.28***	.07**
Received support		-.27	.63**	.55**	.07
Wanted support		.76**	-.54**	-.34	-.20**
Received support ^{2}		-.65**	.35*	.18	.17**
Received X Wanted support		1.29***	-.63***	-.30*	-.34**
Wanted support ^{2}		-.18	.34*	.30*	.05
Requested support		-.34**	.37***	.28***	.09**
Requested X Received support		.33**	-.31***	-.22**	-.09**
Requested X Wanted support		-.20*	.19**	.14*	.05
Requested X Received support ^{2}		.16	-.01	.03	-.04
Requested X Received X Wanted support		-.35***	-.06	-.04	.09**
Requested X Wanted support ^{2}		.02	-.11*	-.10*	-.004
Mediator					
Satisfaction with support				-.26***	

Note. $N = 296$. Unstandardised regression coefficients are reported. * $p < .05$, ** $p < .01$, *** $p < .001$.

Surface values and graphs.

Low requested support. The total, direct and indirect effects of (in)congruence between wanted and received support on time 2 negative affect at low levels of requested support (one *SD* below mean), controlling for time 1 negative affect, are shown in the Table 21. The total and direct effects of the slope and curvature of the line of congruence (wanted support = received support) were both not statistically significant, but their indirect effects were both negatively related to the time 2 negative affect (see Figure 16).

The slope of the line of incongruence (wanted support = -received support) was not statistically significant, indicating that at low levels of requested support, individuals who wanted more support than they received had similar time 2 negative affect to those who received more support than they wanted. The curvature of the line of incongruence was significant and positive, indicating that when low levels of support were requested as the discrepancy between wanted and received support increased, time 2 negative affect increased. The direct and indirect effect were both significant and negative, indicating that the discrepancy between wanted and received support influenced time 2 negative affect directly as well as indirectly through satisfaction with support.

Table 21
Received – wanted support (in)congruence predicting time 2 negative affect when requested low levels of support (one SD below mean), after controlling for time 1 negative affect

Predictor	Total Effect	Direct Effect	Indirect Effect
Constant	.77***	2.16***	-1.39***
Time 1 Negative Affect	.35***	.28***	.07***
Received support	.20	.25*	-.05
Wanted support	-.27*	-.15	-.13***
Received support ^{2}	.33***	.22**	.11***
Received X Wanted support	-.55***	-.35***	-.21***
Wanted support ^{2}	.19	.15	.04
Surface tests			
Congruence line			
Slope	-.07	.10	-.18***
Curvature	-.03	.02	-.06*
Incongruence line			
Slope	.47	.40	.08
Curvature	1.07***	.72***	.36***

Note. $N = 296$. Unstandardised regression coefficients are reported.
*$p < .05$, **$p < .01$, *** $p < .001$.

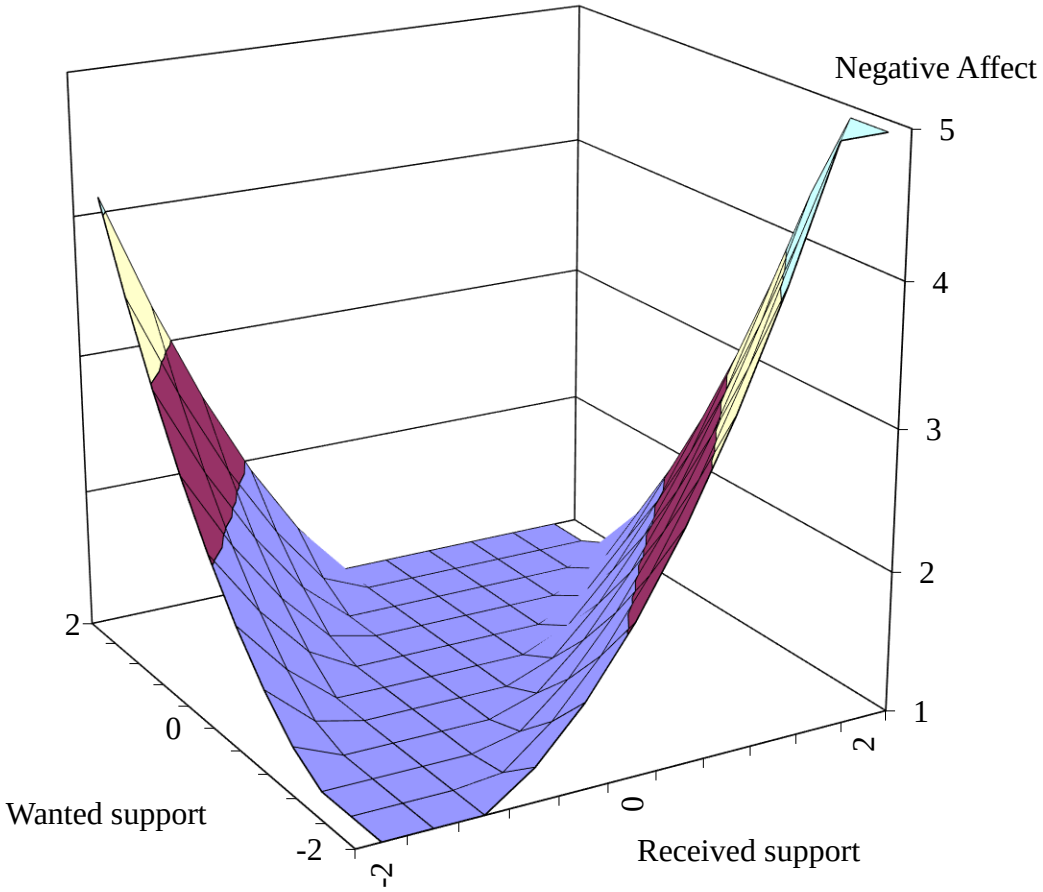

Figure 16. The response surface plot of wanted and received support predicting time 2 negative affect at low levels of requested support, controlling for time 1 negative affect.

High requested support. The total, direct and indirect effects of (in)congruence between wanted and received support on time 2 negative affect at high levels of requested support (one *SD* above mean), controlling for time 1 negative affect, are shown in the Table 22. There was a significant and negative slope along the line of congruence between wanted and received support on time 2 negative affect, indicating that when an individual's wanted and received support were in agreement, time 2 negative affect was lower at high levels of wanted and received support than lower levels (see Figure 17). Only the indirect effect was significant and negative, indicating that congruence predicted time 2 negative affect indirectly through the support satisfaction rather than directly. The curvature of the line of congruence was not statistically significant.

The slope of the line of incongruence was significant and negative, indicating that time 2 negative affect was higher for individuals who wanted more support than they received (i.e., underprovision) than those who received more support than they wanted (i.e., overprovision). Only the indirect effect was significant and negative, indicating that incongruence predicted negative affect indirectly through support satisfaction, but not directly. The curvature of the line of incongruence was significant and positive, indicating that when requested support was high as the discrepancy between wanted and received support increased, time 2 negative affect increased. Only the direct effect was significant and positive, indicating the incongruence between wanted and received support predicted the increased negative affect directly, not through the support satisfaction. The curvature of the line of congruence was not statistically significant.

Table 22
Received – wanted support (in)congruence predicting time 2 negative affect when requested high levels of support (one SD above mean), after controlling for time 1 negative affect

Predictor	Total Effect	Direct Effect	Indirect Effect
Constant	1.43***	2.66**	-1.23***
Time 1 Negative Affect	.35***	.28***	.07***
Received support	-.35***	-.15*	-.20***
Wanted support	.08	.11	-.03
Received support ^{2}	.31***	.27***	.04*
Received X Wanted support	-.45***	-.41***	-.04
Wanted support ^{2}	-.001	-.03	.03
Surface tests			
Congruence line			
Slope	-.27***	-.04	-.23***
Curvature	-.14	-.17	.03
Incongruence line			
Slope	-.43***	-.26*	-.17***
Curvature	.76***	.65***	.11*

Note. $N = 296$. Unstandardised regression coefficients are reported.
*$p < .05$, **$p < .01$, *** $p < .001$.

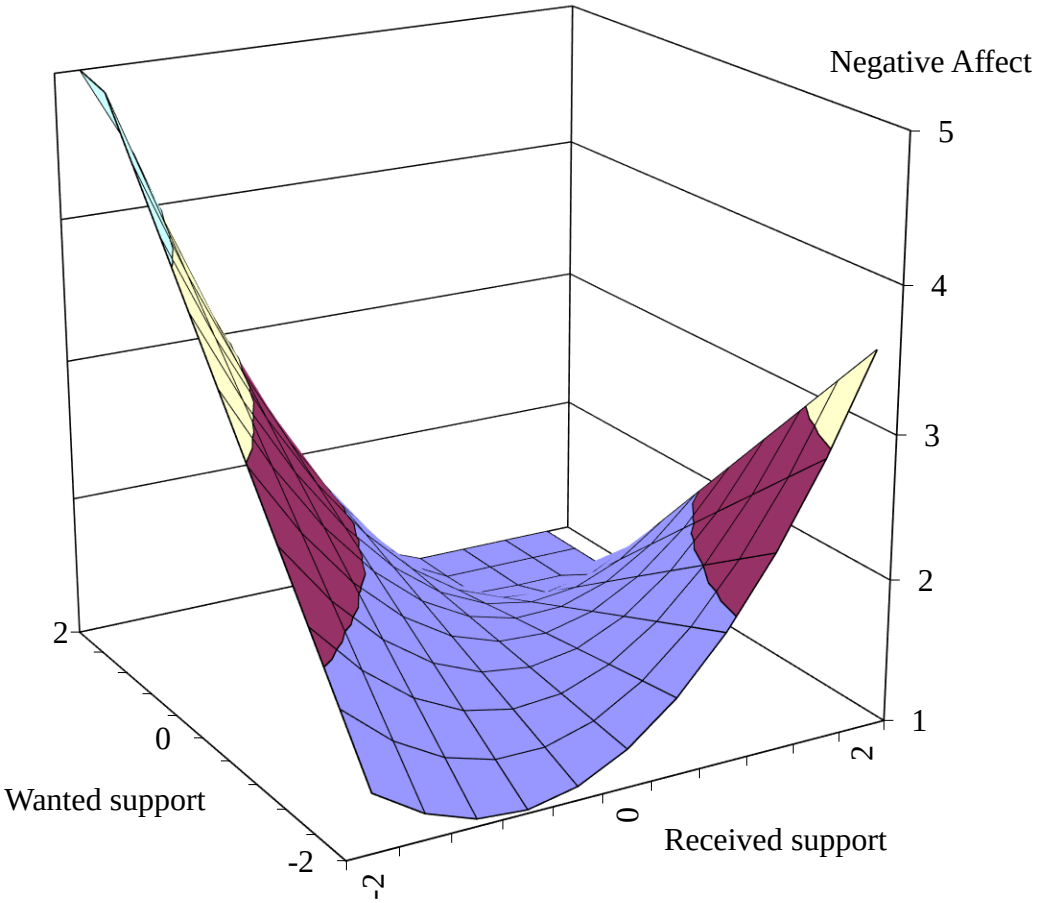

Figure 17. The response surface plot of wanted and received support predicting time 2 negative affect at high levels of requested support, controlling for time 1 negative affect

Discussion

The current study drew on and extended the support adequacy model to examine whether the effects of received support on athletes' affect and self-confidence were contingent on the support wanted and requested, and whether these effects operated via satisfaction with support. Consistent with Chapters 2 and 3, congruency between wanted and received support was associated with favourable outcomes compared to inadequate (incongruent) support regardless of levels of requested support. Unique to this study, requested support moderated the wanted-received support interaction upon self-confidence and affect, with overprovision in particular associated with divergent effects for individuals who requested high levels of support compared to those who requested low levels of support. Further, satisfaction partially mediated the effects of (in)adequate support on outcomes. The findings offer a more nuanced understanding of the mixed effects of received support, particularly overprovision of support, and highlight that polynomial regression is a useful method to understand congruence effects in social support research.

Similar to Chapter 3, the current study utilised polynomial regression with response surface methodology and found that when wanted and received support were congruent, athletes reported higher self-confidence and positive affect, and lower negative affect compared to incongruent support. This finding was regardless of whether individuals requested low or high levels of support. The present findings are consistent with existing literature that adequate support is associated with individuals experiencing more favourable outcomes, such as well-being (e.g., Barden et al., 2016; Brock et al., 2014; Melrose et al., 2015; Priem & Solomon, 2015; Young & Perrewé, 2000). Similar to previous research in social psychology and Chapters 2 and 3, athletes who reported congruency at high levels of wanted and receive support

experienced better outcomes than those with congruency at low levels of wanted and received support (Bar-Kalifa & Rafaeli, 2013). Further, when the discrepancy between wanted and received support became larger (i.e., received more or less support than wanted), self-confidence and affect became poorer. This consistent pattern is in line with the previous research using absolute difference scores between wanted and received support, which have found the unmet social support is universally harmful to the well-being (e.g., Joseph et al., 2016; Matsunaga, 2011).

Unique to this study is the finding that the 3-way interaction of wanted, requested, and received support predicted affect and self-confidence. This finding is consistent with the notion that requested support influences the effects of received support on well-being (Bolger & Amarel, 2007). More specifically, although underprovision was associated with detrimental effects irrespective of how much support was requested, the effects of overprovision varied depending on the level of requested support. Overprovision was as detrimental as underprovision when individuals received unsolicited support, but overprovision became less harmful when individuals had requested high levels of support. Previous research has indicated that underprovision of support is universally associated with worse well-being (Siewert et al., 2011; Wolff et al., 2013), but the effects of overprovision on well-being can sometimes be beneficial (e.g., Coffman et al., 1994; Huang, 2012), sometimes ineffective (e.g., Yragui et al., 2012), and sometimes even harmful (e.g., Brock & Lawrence, 2009; Reynolds & Perrin, 2004; Silverstein et al., 1996). The current findings have offered an explanation for these apparent inconsistent findings and could extend the predictions of the support adequacy model to include requested support alongside wanted and received support. It may be that individuals typically request support when they realise their situation is very difficult and therefore

providing too much support is not associated with detrimental effects such as a reduced sense of autonomy or competence (Bolger & Amarel, 2007).

Similar to Chapter 3, satisfaction with support partially mediated the effects of (in)congruence between wanted and received support, but in the current chapter these indirect effects were relatively consistent across high and low levels of requested support. Satisfaction with support has been associated with favourable outcomes among athletes, such as reduced anxiety and depression (Covassin et al., 2014; Yang et al., 2014), more self-determined motivation (DeFreese & Smith, 2013), and lower burnout and greater life satisfaction (DeFreese & Smith, 2014). Further, support satisfaction was a more important predictor of health than the frequency of received support (Fiorillo & Sabatini, 2011). Previous research (Brown et al., 1987) has indicated that satisfaction with support represents a subjective perspective of (in)congruence between wanted and received support. In the present study, congruence between wanted and received support was generally positively associated with higher self-confidence and positive affect, and with lower negative affect, indirectly through support satisfaction.

The current study has important theoretical, methodological, and applied implications. First, the current study extends the predictions of the support adequacy model. Previous research only investigated the effects of wanted and received support upon well-being (Dehle et al., 2001), but the present study found that requested support moderated the effects of (in)congruence between wanted and received support on well-being, and satisfaction with support partially mediated these effects. Second, this was the first paper to our knowledge to combine the moderated polynomial regression and mediated polynomial regression. In this regard, the current study addressed calls to apply polynomial regression into a more complex model

(Cohen, Nahum-Shani, & Doveh, 2010). This method could be applied in future research across psychological disciplines to explore whether the effects of (in)congruence between two constructs are influenced by a moderator and operate through a mediator. Third, the present findings may assist sport professionals (e.g., coach, fitness trainers) to provide optimal levels of support to their athletes. Athletes should be encouraged to be more proactive in requesting and using social support (Connaughton, Wadey, Hanton, & Jones, 2008; Hassell et al., 2010). More specifically, sport professionals should be cautious with providing too much support if athletes have not explicitly requested much support. In contrast, when athletes request support, it is important that the support providers (e.g., coach) provide higher levels of support, and understand that overprovision is better than underprovision in this scenario. Further, support providers should recognise the importance of athletes' satisfaction with support, as the satisfaction maybe more relevant to well-being than the quantity of support received.

Some limitations should be noted in the current study. Even though the current study was a prospective design (two-time points) instead of a cross-sectional design, it is still not possible to draw strong causal inferences (Hayes, 2013). Future studies should consider alternative research designs to examine the interaction between wanted, requested, and received support on the well-being and performance, such as experimental approaches or repeated measurements over a longer time-frame. For example, studies could monitor the amounts of support athletes want, request, and receive along with their satisfaction with support, well-being and performance on a weekly or monthly basis during an entire competitive season or use a daily diary approach over time (e.g., a month). The study also did not assess the effects of support from specific providers, so future research could address this issue.

In conclusion, the present findings indicated that wanted, requested, and received support have an interactive effect on self-confidence, both directly and indirectly via the satisfaction with support. Hierarchical polynomial regression with response surface analyses helped provide a more nuanced understanding of the complex interplay between different support constructs. By examining requested support as a moderator and satisfaction with support as a mediator, the findings support and extend the predictions of the support adequacy model. When athletes requested low levels of support, they experienced better positive affect (not negative affect and self-confidence) if they received higher congruent support than lower levels; meanwhile they experienced worse affect and self-confidence if they received incongruent support, and overprovision had a similar detrimental effect to underprovision. When athletes requested high levels of support, they experienced better affect and self-confidence if they received higher congruent support than lower levels; meanwhile they also experienced worse affect and self-confidence if they received less support than they had wanted (i.e., underprovision). Overprovision was associated with less detrimental effects following a request for high levels of support. The present study therefore highlights the interesting insights that can be gained with polynomial regression, that requested support may help explain the inconsistent effects observed for overprovision, and that can sports professionals should consider athletes' wanted and requested support when evaluating how much support to provide.

Table 23
The aim and main findings of Chapter 4

Chapter	Aim	Findings
4	• To explore whether requesting support further impacts upon the influence of wanted and received support on psychological well-being, and whether these effects operate indirectly via satisfaction with support using polynomial regression analyses.	• Requested support moderated the influence of wanted and received support, and these effects were generally mediated by the satisfaction with support. • Increases in the discrepancies between wanted and received support were associated with poorer self-confidence, positive affect, and negative affect, irrespective of the levels of requested support. • When athletes requested low levels of support, higher levels of adequate support (high received = high wanted) predicted better positive affect compared to lower levels of adequate support (low received = low wanted). Whereas when athletes requested high levels of support, higher level of adequate support predicted more favourable self-confidence, positive affect, and negative affect compared to lower levels of adequate support. • At low level of requested support, overprovision was as detrimental as underprovision on self-confidence, positive affect, and negative affect. Whereas at high level of requested support, overprovision was associated with more favourable self-confidence, positive affect, and negative affect compared to underprovision.

Chapter 5: General Discussion

Summary of the Findings

Across four studies, this thesis investigated factors that influence the effectiveness of received support on performance and psychological outcomes using the support adequacy model as a key framework. Specifically, the role of wanted and requested support were explored along with ethnicity and satisfaction with support.

Study 1 (See Chapter 2a) used an experimental protocol to examine how wanted support and received support influenced performance and psychological outcomes (i.e., self-confidence and affect). In this study, novice golfers completed a questionnaire assessing how much support they would want prior to a golf-putting task, before being split into high and low wanted support, and then further randomly assigned to receive either a support manipulation or control group. Significant interactions of wanted support and received support were only found on psychological outcomes, but not performance. Planned comparison analyses found that participants in the adequate support condition (high wanted, support manipulation) had significantly higher positive affect compared to those in the reference condition (low wanted, control). Participants in the underprovision condition (high wanted, control) had significantly lower positive affect compared to those in the reference condition. Participants in the overprovision condition (low wanted, support manipulation) did not have significantly different positive affect to those in the reference condition. The results were broadly similar for self-confidence and negative affect. These findings provided experimental evidence for the predictions of the support adequacy model and the study was the first to test this model in sporting contexts. A key limitation of this study was that participants did not attempt the golf-putting task before rating what support they wanted. As a result, participants may not have been able to accurately evaluate the amount of support that

they really wanted. Furthermore, the study did not measure the baseline level of outcomes. These issues were addressed in Study 2.

Study 2 (See Chapter 2b) again used an experimental protocol to examine how wanted support and received support influenced self-confidence and performance. After completing the baseline task, novice golfers completed a questionnaire assessing how much support they would want if they were to reattempt the task. They were then split into high and low wanted support, and further randomly assigned to receive either a support manipulation or to the control group, before attempting the task again. After controlling for gender and baseline self-confidence/performance, the self-confidence and performance of participants in the adequate support condition improved significantly more compared to those in the reference condition. The self-confidence and performance change were significantly lower for participants in the underprovision condition compared to those in the reference condition. Participants in the overprovision condition experienced significantly greater improvement in self-confidence but not performance than those in the reference condition. In conclusion, study 2 provided further experimental evidence for the support adequacy hypothesis but was unique in demonstrating effects on objective performance outcomes.

Study 3 (See Chapter 3) focused on the interaction between wanted and received support on self-confidence and affect in the athletes' daily lives using a cross-sectional survey design. Polynomial regression analyses were used to explore these effects, whether they were mediated by satisfaction with support, and whether findings were consistent across Western (British athletes) and Eastern (Chinese athletes) cultures. The findings of Study 3 were broadly consistent with Study 1 and Study 2 and the previous literature (e.g., Bar-Kalifa & Rafaeli, 2013; Siewert et al., 2011), and there were no cultural differences found with regards the key predictions

of the support adequacy model. Across both samples: 1) athletes experienced better self-confidence and positive affect (but not the negative affect) when they received adequate support (received=wanted), especially at higher levels of received and wanted support, compared to when wanted and received support were not congruent; 2) athletes experienced better self-confidence and affect when they experienced overprovision of support rather than underprovision; 3) support (in)adequacy predicted self-confidence and affect indirectly through satisfaction with support. In conclusion, Study 3 indicated that the effects of support (in)adequacy influenced well-being indirectly by support satisfaction, and these effects were consistent in both British and Chinese athletes.

Study 4 (See Chapter 4) replicated and extended the design of Study 3 to control for levels of self-confidence and affect one week before the competition. Further, Study 4 examined whether requested support moderated the effects of wanted and received support on self-confidence and affect, and whether satisfaction with support mediated these effects. After controlling for Time 1 (i.e., one week before a competition) outcomes, the effects of (in)congruence between wanted and received support on Time 2 (i.e., one day before the same competition) outcomes were moderated by requested support. More specifically, when athletes requested low levels of support, and their wanted and received support were congruent, support satisfaction and in turn time 2 outcomes were more favourable at high wanted and received support than at low levels; support satisfaction and time 2 outcomes became less favourable as incongruence between wanted and received support increased. When athletes requested high levels of support, and their wanted and received support were congruent, support satisfaction and in turn time 2 outcomes were more favourable at high wanted and received support than at low levels; however, when

wanted and received support were incongruent, support satisfaction and time 2 outcomes were more favourable in individuals who received more support than they wanted (i.e., overprovision) than those who wanted more support than they received (i.e., underprovision). In conclusion, requested support further moderated the effects of support (in)adequacy on well-being,

Table 24
Summary of the findings of the two experiments

Chapter	Outcomes	Findings		
		Adequacy	Underprovision	Overprovision
2a	Self-confidence	+	-	○
	Positive Affect	+	-	○
	Negative Affect	○	-	○
	Performance	n/a	n/a	n/a
2b	Self-confidence change	+	-	+
	Performance change	+	-	○

Note. +: significantly better than the reference condition.
-: significantly worse than the reference condition.
○: no significant difference compared to the reference condition.
n/a: no significant interaction between wanted and received support on the performance, therefore, planned comparison analyses are not available.

Table 25
Summary of the findings of the polynomial regression analyses

Chapter		Outcomes	Findings		
			Adequacy at higher levels of support better than lower levels	Greater inadequacy related to worse outcomes	Overprovision better than Underprovision
3	British Athletes	Self-confidence	T, I	T, I	T, I
		Positive Affect	T, I	T, I	T, I
		Negative Affect	I	T, I	T, I
	Chinese Athletes	Self-confidence	T, I	T, I	T, I
		Positive Affect	T, I	T, I	T, I
		Negative Affect	I	T, I	T, I
4	Low Requested	Self-confidence	I	T, I	N
		Positive Affect	T, I	T, I	N
		Negative Affect	I	T, I	N
	High Requested	Self-confidence	T, I	T, I	T, I
		Positive Affect	T, I	T, I	T, I
		Negative Affect	T, I	T, I	T, I

Note. T = a significant total effect.
I = a significant indirect effect through satisfaction with support.
N = neither a total nor indirect effect

Significance of the Findings

As mentioned in the literature review, received support has been associated with inconsistent effects and research has begun to investigate factors that influence the effectiveness of received support (e.g., Feeney & Collins, 2015; Uchino, 2009). Dehle et al. (2001) classified supportive exchanges in terms of underprovision (receiving less support than wanted), overprovision (receiving more support than wanted), and adequate support (receiving the same amount of support as wanted). The existing literature has found that adequate support is generally beneficial (e.g., Melrose et al., 2015; Priem & Solomon, 2015), and underprovision is universally harmful to the well-being (e.g., Matsunaga, 2011; Thong et al., 2007), but overprovision is sometimes beneficial (e.g., Siewert et al., 2011) sometimes ineffective (e.g., Bar-Kalifa & Rafaeli, 2013), and can even be harmful (e.g., Brock & Lawrence, 2009). However, there have been some issues in the methodology applied to measure the (in)adequacy between wanted and received support in the wider literature, and very few studies have investigated moderators and/or mediators of the effects of support (in)adequacy upon outcomes. The present thesis addressed these issues and found that (in)adequacy between wanted and received support predicted athletes' well-being and performance, that the support adequacy model can be generalised to different cultures, and the effects of (in)adequate support are moderated by requested support and mediated by satisfaction with support.

The present thesis was the first research to investigate the (in)adequacy between wanted and received support in sports contexts. Previous research has applied the support adequacy model in organisational settings (Beehr et al., 2010; Seiger & Wiese, 2011; Young & Perrewé, 2000), in patients with physical and mental disease (Cho et al., 2012; High & Steuber, 2014; Koenders et al., 2015; Linden &

Vodermaier, 2012; Reynolds & Perrin, 2004; Thong et al., 2007), and in couples (Bar-Kalifa & Rafaeli, 2013; Brock & Lawrence, 2008, 2009, 2014; Joseph et al., 2016). Consistent with the existing literature, the current thesis found that adequate support was consistently beneficial (e.g., Melrose et al., 2015), underprovision was generally detrimental, and overprovision had inconsistent effects (e.g., Bar-Kalifa & Rafaeli) on athletes' well-being. The findings may offer an explanation of the ineffectiveness of received support in sports contexts (e.g., Udry et al., 1997; Yang et al., 2014), that is, the received support is more effective when it met individuals' needs (Cutrona & Russell, 1990; Dehle et al., 2001).

Previous research into the support adequacy model has generally sampled Western cultures (e.g., Dehle et al., 2001), with very few samples from Eastern cultures (e.g., Huang, 2012), and no comparisons across the two. Previous research found that there were differences among individuals from Western cultures (i.e., American) and Eastern cultures (i.e., Chinese) in terms of different amounts of wanted and received support (Faw et al., 2018; Xu & Burleson, 2001). Study 3 found that Chinese athletes wanted and received higher levels of support than British athletes. However, the findings from Study 3 suggest the pattern of relationships of (in)adequacy between wanted and received support on outcomes was generally consistent across Chinese and British athletes. As such, the findings indicate the support adequacy model can be applied into different cultures.

Theoretical Implications

Study 4 extended the key focus of the support adequacy model to include requested support alongside wanted and received support. Compared to the existing literature, the findings of Study 4 were consistent with the notion that the effectiveness of received support is contingent on wanted support (e.g., Dehle et al.,

2001), but were novel in demonstrating that requested support may also be an important consideration. The beneficial effects of adequate support and the detrimental effects of underprovision on outcomes were consistent irrespective of the levels of requested support; however, when individuals requested low levels of support, overprovision of support was as harmful as underprovision, but when they requested high levels of support, overprovision was associated with better well-being than underprovision. This finding offers evidence for the notion that seeking social support may be an adaptive coping strategy for the athletes who are facing stressful events (Nicholls & Polman, 2007). The original support (in)adequacy model, therefore, could be extended to a more comprehensive model that includes the 3-way interaction of wanted, requested, and received support on outcomes.

Both Study 3 and Study 4 found that satisfaction with support mediated the effect of support (in)adequacy on self-confidence and affect, and these effects were generally consistent across two cultures (Study 3) and different levels of requested support (Study 4). The current findings support Brown and colleagues preliminary research that satisfaction with support may be a subjective perspective of (in)adequacy between wanted and received support although they only examined the effects on well-being of underprovision and not adequate support or overprovision on well-being, and they did not conduct mediation analysis (e.g., Brown et al., 1987). The findings of Study 3 and Study 4 also are consistent with evidence that satisfaction with support is beneficial to athletes' well-being (DeFreese & Smith, 2013, 2014), and may be a more crucial variable for health than the amount of received support (e.g., Fiorillo & Sabatini, 2011). Further, the effects of satisfaction with support and requested support upon (in)adequacy support are in line with the goal-matching model (Horowitz et al., 2001), which suggests that individuals who

request support have goals, such as desiring specific help and support, and that satisfaction with support will be increased if these goals (i.e., the desire for support) is met. Overall, the current findings imply that support satisfaction could also be integrated into the original support adequacy model alongside requested support.

Methodological Implications

There are some methodological implications from the current thesis. With regard to the method of examining the support adequacy model, lab-based experiments are rare (for exceptions, see Joseph et al., 2016; Searle et al., 1999, 2001). The current two experimental studies (Study 1 and Study 2) adapted a protocol from a previous social support experiment (Rees & Freeman, 2010) and generally provided support for the support adequacy model with regards to psychological outcomes; evidence was more varied for performance. Similar to the previous research (Searle et al., 1999), Study 1 was conducted using a between-subjects design experiment and found that support (in)adequacy did not predict performance. However, Study 2 further developed the experimental protocol, with participants asked to perform the golf-putting task before evaluating the support that they wanted. The advantages of this protocol are that it allowed baseline performance to be accounted for and may have enabled participants to more accurately assess the amount of support that they wanted to receive before their next task. In study 2, significant effects were found for support (in)adequacy on performance. Future studies should therefore include a baseline task, but could also consider other forms of within-subject experimental designs to investigate the relationship between support (in)adequacy and performance.

Study 3 translated the ARSQ (Freeman et al., 2014) into Chinese and found good content validity with Chinese athletes. The Chinese version of ARSQ (ARSQ-

C) may contribute to the research of sports psychologists in China and address the calls of Kim et al. (2008) that more social support studies are needed in Eastern cultures. The findings are consistent with the Japanese version of ARSQ (ARSQ-J) (Katagami & Tsuchiya, 2016, 2017) that also found good internal reliability and validity. Collectively the findings suggest that, the ARSQ is a robust instrument that appears to work well across the cultures.

Study 3 and Study 4 were the first studies to apply polynomial regression analysis in social support research and one of the first in the sport psychology literature (for an exception, see Benson, Eys, & Gregory Irving, 2016). As noted previously, the majority of literature that has examined the effects of support (in)adequacy has used the difference score method, which has methodological issues such as low internal consistency reliability and reduced effect sizes (e.g., Edwards, 2001). Even though researchers have used alternative methods to investigate the support (in)adequacy model such as the interaction between wanted and received support (e.g., Searle et al., 2001), the proportion of support (in)adequacy (e.g., Melrose et al., 2015), and perceptions of support (in)adequacy (e.g., Brock et al., 2014), polynomial regression analysis may offer a more comprehensive framework to examine the support (in)adequacy model (Edwards, 2001). For example, it allows the separate and combined effects of wanted and received support to be examined, along with linear and non-linear relationships of support (in)adequacy on outcomes. Further, Study 4 was the first empirical study in any psychological discipline to our knowledge to integrate three-way moderated polynomial regression and mediation. This approach addressed calls to apply polynomial regression within a more complicated model (Cohen et al., 2010). The approach applied in Study 4 could be used in any psychological research that aims to explore the effects of (in)congruence

between two variables that may be moderated by a third variable and/or mediated by another variable.

Practical Implications

There are some important practical implications of the current thesis for athletes and their support networks (e.g., coach, family). The findings generally showed the beneficial effects of adequate support and the detrimental effects of underprovision on psychological outcomes and, in Study 2 only, performance. Although athletes may consider that seeking or receiving support is a sign of weakness and incompetence (Pensgaard & Roberts, 2003), the current findings support recommendations that athletes should be encouraged to request and use social support (e.g., Connaughton et a., 2008; Hassell, Sabiston, & Bloom, 2010). Study 3 found that although Chinese athletes wanted and received more support than British athletes, there was no cultural difference in the importance of providing adequate support. Within and across cultures, therefore, coaches and other support personnel should ensure that they aim to provide athletes with support that is similar to what they wanted. As such, members of athletes' support network, should be educated how to recognise what support athletes want, and given training to provide the required support. Athletes and their support personnel may benefit from training in communication skills to encourage open and effective dialogue around support needs. In terms of enhancing performance, Study 2 suggests that it may be necessary for athletes to attempt tasks before support is provided to enable them to recognise what support they want and thereby maximise the impact of matched support.

In line with previous research, overprovision of support was associated with different effects across this thesis. For example, it has been associated with beneficial effects (Chapter 3; Huang, 2012), null effects (Bar-Kalifa & Rafaeli, 2013; Chapter

2), or detrimental effects (Brock & Lawrence, 2009; Chapter 4). This suggests athlete support personnel should be careful not to provide too much support in some circumstances. The key finding of Study 4 is that overprovision of support is beneficial for well-being when athletes always request support, whereas overprovision is as detrimental as underprovision when athletes don't request it. This finding is crucial for the athletes in a competitive sports context as coaches and/or teammates often provide instructions or the other supportive behaviours even though the athletes do not explicitly request it (Rees & Freeman, 2012). This finding is also important for the athletes in a non-competitive sports context, as parental overinvolvement can bring negative feelings to the athletes, and therefore may result in poorer well-being and performance (Fredricks & Eccles, 2004).

Methodological Limitations

One limitation of the current thesis is that only the recipients' perspective of received support was measured. However, supportive behaviours can be measured from other perspectives, for example, support providers can report the amount of support they offered (Goldsmith, 2004), and the observers/researchers can record and code the supportive acts occurred in a well-controlled situation (Burleson & MacGeorge, 2002). In social psychology, the term support concordance has been defined as the situation in which support providers and receivers agree on the support exchange, and this is associated with more fulfilled expectations (i.e., adequate support) (Coriell & Cohen, 1995). Indeed, in Study 1 and Study 2 the manipulation check data indicated that participants generally correctly recognised whether the expert golfer/coach offered them with support and therefore the findings in those studies may partly reflect support concordance. However, in Study 3 and Study 4, provided support was not manipulated or measured, and this could be addressed in

future as providers and receivers may sometimes have inconsistent accounts of support exchanges (Bolger et al., 2000; Coriell & Cohen, 1995). Future studies could also measure support provided by certain sources within the athletes' support network (e.g., coach, parents) as well as athletes' received support.

Another limitation of the thesis is that only the amount of the overall support was analysed, but not different dimensions of support. Similarly, many previous studies did not distinguish different dimensions of support when examining the support adequacy model (e.g., Dehle et al., 2001) or support exchanges in sport (Freeman & Rees, 2008). There are some studies though that examined different dimensions of support, for example, Brock and Lawrence (2009) examined the effects of underprovision and overprovision across esteem, emotional, informational, and tangible support. The two questionnaire-based studies (Study 3 and Study 4) employed the ARSQ (Freeman et al., 2014), which also measured these four dimensions of support. However, analysing each type of support that athletes wanted more, or less, or the same in the polynomial regression would be extremely difficult.

The design of each study also has strengths and limitations. Even though experimental designs offer the ability to control for potentially confounding effects and may offer a stronger ability to draw causal inferences in social support research (Bolger & Amarel, 2007), in the current experiments (Study 1 and Study 2) the second experimenter played the role of support provider and did not know the participants. In contrast, in athletes' daily support exchanges, their support providers (e.g., coach, parents) are more likely to have a prior relationship with them. Hence, the experimental studies may not be generalised outside of the laboratory (Burleson & MacGeorge, 2002). Study 3 and Study 4 did measure athletes' daily, naturalistic support exchanges, but a limitation of these studies is their correlational nature.

Despite the different research designs employed in the thesis though, the findings generally converged across the four studies suggesting the predictions of the support adequacy model may be robust. Future studies should continue to use different research designs including experiments and survey designs including longitudinal (Brock & Lawrence, 2009) and daily diary approaches (e.g., Bar-Kalifa et al., 2013).

Future Research

The current thesis aimed to examine the interactions of wanted and received support on performance and psychological outcomes. As mentioned above, there are some limitations of this thesis, which future studies could seek to address. For example, there was no prior relationship between support providers and recipients in the current experiments, and future work could therefore explore the potential effects of relationship-related factors (Rafaeli & Gleason, 2009; Uchino et al., 2011). Indeed, there are some studies that examined the support adequacy model by asking participants to bring their partner to the lab, then one played the role of the support provider, and the other one acted as support recipient (e.g., Joseph et al., 2016; Priem et al., 2015). When applying this setting in sports contexts, researchers could recruit athletes with an important support provider (e.g., partner, parents, coach, teammate). The support provider could then either provide a scripted supportive message or help the athletes naturally but in a controlled setting that allows the support exchange to be captured. These methods could therefore integrate recipients' and providers' perspectives, or use independent observers to code and rate all the support behaviours including verbal and nonverbal communications (e.g., Priem et al., 2015). Exploring the concordance of provided and received support may help to further develop the support adequacy model (Coriell & Cohen, 1995). Similarly, future research employing a survey design could explore support received from different providers.

Consistent with the number of studies examining the support adequacy model which focused on individuals' entire social networks (e.g., Matsunaga, 2011; Melrose et al., 2015; Siewert et al., 2011), Study 3 and Study 4 measured the support received from across athletes' social network. However, some research has measured individuals wanted and received support from a specific provider, such as partner (Brock & Lawrence, 2009), children (Huang, 2012), and workplace supervisor (Yragui et al., 2012). Future studies should therefore consider the specific support sources when exploring the support adequacy model in sport, as athletes may want and receive different support from their coaches, parents, and peers (Keegan, Harwood, Spray, & Lavallee, 2009; Keegan, Spray, Harwood, & Lavallee, 2014). The effects of support sources may be particularly important in cultural difference research (e.g., Wang et al., 2010). For example, Wang et al. (2010) found that Asian American students utilised more support from discretionary ties such as peers, rather than the kinship ties such as their parents. Their European American counterparts, however, tended to seek support in the contrary pattern.

To further establish the generalisability of the support adequacy model in sport, future research could use different outcomes and participants. The current thesis measured psychological outcomes and motor task performance among athletes. Limited research has examined the predictions of the support adequacy model on physiological outcomes such as salivary cortisol recovery (e.g., Priem & Solomon, 2015) and cognitive task performance (e.g., Searle et al., 1999, 2001). Hence, these issues could be addressed in future studies in sports contexts. Further, the current thesis sampled healthy and active student-athletes, whereas a number of studies have examined the support adequacy model among patient populations (Koenders et al., 2015; Linden & Vodermaier, 2012; Reynolds & Perrin, 2004). As social support plays

a central role for athletes during injury rehabilitation (e.g., Rees et al., 2010), future studies should examine whether support adequacy model can explain outcomes in injured athletes.

Conclusion

Using the support adequacy model (Dehle et al., 2001) as the theoretical framework, the current thesis examined the interactive effects of wanted and received support on outcomes, whether these relationships generalised across cultures, were moderated by requested support, and mediated by satisfaction with support. Across four studies, this thesis found that received support was more beneficial when it was congruent with what athletes wanted, especially when individuals wanted and received high levels of support. In contrast, as the discrepancy between wanted and received support increased, outcomes became less favourable. However, individuals receiving more support than they wanted (i.e., overprovision) was generally more beneficial to outcomes than receiving less support than wanted (i.e., underprovision) unless individuals had not requested much support. The effects of support (in)adequacy were generally robust across different cultures (British and Chinese athletes), experimental and survey designs, and the effects were partially mediated by support satisfaction. The current thesis was the first series of studies to apply the support adequacy model into sports contexts, which provides a number of important implications. The findings provide evidence for, and extend the predictions of, the support adequacy model, and that novel insights can be provided by using polynomial regression in social support research. Indeed, the polynomial regression approach developed in Study 4 could be used in future research across psychological disciplines to explore whether the effects of (in)congruence between two constructs are influenced by a moderator and operate through a mediator. Athletes and their

social network should be encouraged to use social support, but be cognisant that it is support exchanges are congruent with what the athlete wants and sensitive to requests for support.

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Appendices

Appendix - I

Study 1 - Screening Questionnaires

This study focuses on the help and support you have as a sportsperson, along with your thoughts and performance towards a golf-putting task. You will be shown a golf-putting task and then asked to complete a brief questionnaire. A selection of participants will then be invited to attend a laboratory to participate in the golf-putting task.

The information you provide will be used only for the purpose of this research and you will not be identified individually. Your name and e-mail address are only required so we can contact you about the golf-putting task. As such, your confidentiality is assured.

Please try to answer all the questions in this booklet. 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.

Firstly, please fill out the information about yourself below.

Today's date: _____

Name: _____

e-mail: _____

Age: _____

Gender: (please circle) Female Male

Ethnic Group: (please circle) White | Mixed/ Multiple ethnic group | Asian/ Asian British | Black/ African/ Caribbean/ Black British | Other

Main sport: _____

Years played that sport: _____

Current competitive level: (please circle)

Recreational | Club | Regional/ County | National | International

Experience of golf: (please circle)

None | Very little | Somewhat | Moderate | A lot

WHEN YOU HAVE FINISHED PLEASE CHECK YOU HAVE COMPLETED ALL THE QUESTIONS

Below is a description of a golf-putting task that we are using in an ongoing research project. Please read the description before completing the short questionnaire that follows.

The task consists of ten putts from a distance of two metres to a regulation-size golf hole on an indoor putting green (see Figure 1).

Figure 1. Example of the putting green.

It is very important that participants try, ideally, to get the ball in the hole or finish the ball as close to the hole as they possibly can with each putt. The experimenters would instruct participants when they could take each putt, and then the participant could hit each putt in their own time. After each putt, the experimenters would record the distance the ball finishes from the hole.

The average distance from the hole would be calculated for each participant and placed on a leader board. At the end of the study the leader board would be emailed to all participants and displayed on a noticeboard. The top three performers would be awarded cash prizes of £30, £20, £10, respectively, whilst the worst three performers would be interviewed at length about their poor performance. Finally, each putt would be recorded on a digital video camera and might be used to aid teaching and presentations in the future.

Crucially though, the task would not be completed with a standard golf putter. Rather participants would have to use a modified golf putter called the "Rhythmiser" (see Figure 2). The Rhythmiser would make the task harder than a standard golf putter because it has a highly flexible shaft that accentuates any idiosyncrasies or deficiencies in the user's putting stroke. This can make it hard do well on the task without experience of the putter and/or an effective putting technique.

Figure 2. The Rhythmiser putter.

Please now complete the following questionnaire.

Please indicate on the list below the types of support you would want to receive prior to attempting the task.

Prior to attempting the golf-putting task, would you want the someone to …		***Yes***	***No***
1.	encourage you	☐	☐
2.	give you advice about performing the task	☐	☐
3.	cheer you up	☐	☐
4.	give you tactical advice	☐	☐
5.	emphasise your abilities	☐	☐
6.	listen to you	☐	☐
7.	offer you ideas and suggest actions	☐	☐
8.	tell you, you can do it	☐	☐
9.	help you put things in perspective	☐	☐
10.	show concern for you	☐	☐
11.	help you decide what to do	☐	☐
12.	reinforce the positives	☐	☐
13.	give you advice about what to do	☐	☐
14.	make you feel that they would always be there for you	☐	☐
15.	comfort you	☐	☐
16.	boost your confidence	☐	☐

Thank you very much for your help

Study 1 - Golf Putting Task Questionnaires

This questionnaire asks you for some thoughts about the upcoming golf-putting task. Please try to answer all the questions in this booklet. 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.

To help us match your answers with the questionnaire you previously completed, please first write down your name.

Name:_____

	Please indicate, by ticking yes or no, whether the *expert golfer* did…	***Yes***	***No***
1.	offer you advice / guidance?	☐	☐
2.	offer you encouragement?	☐	☐
3.	show concern for you?	☐	☐
4.	offer you support?	☐	☐

	Please indicate how you feel *right now* about the upcoming golf-putting task by ticking one response option per question.	**not at all**	**somewhat**	**moderately**	**very much so**
1.	I feel self-confident	☐	☐	☐	☐
2.	I'm confident I can meet the challenge	☐	☐	☐	☐
3.	I'm confident about performing well	☐	☐	☐	☐
4.	I'm confident because I can mentally picture myself reaching my goal	☐	☐	☐	☐
5.	I'm confident of coming through under pressure	☐	☐	☐	☐

Please read each word below and indicate the extent you feel this *right now, at this moment, in relation to the upcoming task* by ticking one response option per question.		**not at all**	**slightly**	**moderately**	**considerably**	**extremely**
1.	Upset	☐	☐	☐	☐	☐
2.	Excited	☐	☐	☐	☐	☐
3.	Nervous	☐	☐	☐	☐	☐
4.	Enthusiastic	☐	☐	☐	☐	☐
5.	Interested	☐	☐	☐	☐	☐
6.	Distressed	☐	☐	☐	☐	☐
7.	Strong	☐	☐	☐	☐	☐
8.	Guilty	☐	☐	☐	☐	☐
9.	Scared	☐	☐	☐	☐	☐
10.	Hostile	☐	☐	☐	☐	☐
11.	Proud	☐	☐	☐	☐	☐
12.	Alert	☐	☐	☐	☐	☐
13.	Ashamed	☐	☐	☐	☐	☐
14.	Inspired	☐	☐	☐	☐	☐
15.	Determined	☐	☐	☐	☐	☐
16.	Attentive	☐	☐	☐	☐	☐
17.	Jittery	☐	☐	☐	☐	☐
18.	Active	☐	☐	☐	☐	☐
19.	Afraid	☐	☐	☐	☐	☐
20.	Irritable	☐	☐	☐	☐	☐

Thank you very much. You should now attempt the golf-putting task

Appendix - II

Study 2 - Golf Putting Task Questionnaires

This study focuses on help and support, and your thoughts and performance towards a golf-putting task. The information you provide will be used only for the purpose of this research and you will not be identified individually. Your name and e-mail address are only required so we can contact you regarding the potential prize money. As such, your confidentiality is assured. Please try to answer all the questions in this booklet. 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.

Firstly, please fill out the information about yourself below.

Name: _____

E-mail: _____

Age: _____

Gender: (please circle) Female Male

Ethnic Group: (please circle) White | Mixed/ Multiple ethnic group | Asian/ Asian British | Black/ African/ Caribbean/ Black British | Other

Main sport: _____

Years played that sport: _____

Current competitive level: (please circle)

Recreational | Club | Regional/ County | National | International

Experience of golf: (please circle)

None | Very little | Somewhat | Moderate | A lot

Please indicate how you feel *right now* about the upcoming golf-putting task by ticking one response option per question.		**not at all**	**somewhat**	**moderately**	**very much so**
1.	I feel self-confident	☐	☐	☐	☐
2.	I'm confident I can meet the challenge	☐	☐	☐	☐
3.	I'm confident about performing well	☐	☐	☐	☐
4.	I'm confident because I can mentally picture myself reaching my goal	☐	☐	☐	☐
5.	I'm confident of coming through under pressure	☐	☐	☐	☐

<u>Please now stop and attempt the golf-putting task.</u>

Now that you have completed the golf-putting task, please complete the following questionnaires.

Please indicate on the list below the types of support you would want to receive from the golf coach if you were to perform the task again.

Prior to attempting the golf-putting task, would you want the golf coach to …		***Yes***	***No***
1.	encourage you	☐	☐
2.	give you advice about performing the task	☐	☐
3.	cheer you up	☐	☐
4.	give you tactical advice	☐	☐
5.	emphasise your abilities	☐	☐
6.	listen to you	☐	☐
7.	offer you ideas and suggest actions	☐	☐
8.	tell you, you can do it	☐	☐
9.	help you put things in perspective	☐	☐
10.	show concern for you	☐	☐
11.	help you decide what to do	☐	☐
12.	reinforce the positives	☐	☐
13.	give you advice about what to do	☐	☐
14.	make you feel that they would always be there for you	☐	☐
15.	comfort you	☐	☐
16.	boost your confidence	☐	☐

Please read each of the following items and rate each item from Always to Never, according to how often that item applies to you now.		Always	Frequently	Neutral	Sometimes	Never
1.	I eat at least one balanced meal a day.	☐	☐	☐	☐	☐
2.	I get 7-8 hours of sleep at least four nights a week.	☐	☐	☐	☐	☐
3.	I exercise to the point of perspiration at least twice a week.	☐	☐	☐	☐	☐
4.	I am the appropriate weight for me height.	☐	☐	☐	☐	☐
5.	I have money adequate to meet basic expenses.	☐	☐	☐	☐	☐
6.	I get strength from my religious beliefs, or I feel comfortable with my view of the universe and my place in it.	☐	☐	☐	☐	☐
7.	I regularly attend club or social activities.	☐	☐	☐	☐	☐
8.	I am in good health (including eyesight, hearing, teeth).	☐	☐	☐	☐	☐
9.	I am able to speak openly about my feelings when angry or worried.	☐	☐	☐	☐	☐
10.	I do something for fun at least once a week.	☐	☐	☐	☐	☐
11.	I am able to organise my time effectively.	☐	☐	☐	☐	☐
12.	I take quiet time for myself during the day.	☐	☐	☐	☐	☐

Before you complete the golf-putting task a second time, please complete the following questionnaire.

	Please indicate, by ticking yes or no, whether the *golf coach* did…	***Yes***	***No***
1.	offer you advice / guidance?	☐	☐
2.	offer you encouragement?	☐	☐
3.	show concern for you?	☐	☐
4.	offer you support?	☐	☐

	Please indicate how you feel *right now* about the upcoming golf-putting task by ticking one response option per question.	**not at all**	**somewhat**	**moderately**	**very much so**
1.	I feel self-confident	☐	☐	☐	☐
2.	I'm confident I can meet the challenge	☐	☐	☐	☐
3.	I'm confident about performing well	☐	☐	☐	☐
4.	I'm confident because I can mentally picture myself reaching my goal	☐	☐	☐	☐
5.	I'm confident of coming through under pressure	☐	☐	☐	☐

Thank you very much. You should now attempt the golf-putting task

Appendix - III

Study 3 - Content Validity Assessment

This study focuses on the help and support athletes receive from members of their support network (e.g., family, friends, coaches, teammates). The information you provide will be used only for the purpose of this research and you will not be identified individually. As such, your confidentiality is assured.

Please answer all the questions in this booklet. 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.

Firstly, please fill out the information about yourself below.

Age: _____

Gender: _____

Ethnicity: _____

Main sport: _____

Years played that sport: _____

Current competitive level: (please circle)

Recreational	Club	Regional/ County	National	International

As researchers, we're interested in the different types of resources that athletes might receive from their support network. We have developed a measure to assess potentially supportive behaviours and messages that athletes receive from friends, family, coaches, teammates, medical staff, etc. Below are 22 items. We would appreciate your feedback on whether you understand the items and view them as relevant to Chinese athletes across different sports and competitive levels.

For each item there are two answer columns. Having read the item, please rate in column 1, the extent to which you understand the item (on a scale from 0 = not at all well to 4 = extremely well).

In column 2, please rate the extent to which you think the item is relevant for sports people (on a scale from 0 = not at all relevant to 4 = extremely relevant).

In the actual questionnaire distributed to future participants/athletes, all items would be preceded by the generic stem:

In the last week, how often did someone…

Item	**Column 1: Understanding** (0 = not at all well, 1 = slightly, 2 = moderately, 3 = considerably, 4 = extremely well)	**Column 2: Relevance** (0 = not at all relevant, 1 = slightly, 2 = moderately, 3 = considerably, 4 = extremely relevant)
1. encourage you		
2. give you advice about performing in a competitive situation		
3. help plan your training		
4. give you tactical advice		
5. help with transport to training and competition/matches		
6. offer you ideas and suggest actions		
7. do things for you at training and competitions/matches		
8. help you put things in perspective		
9. help set sessions in training		
10. help you decide what to do		

11. help you with tasks		
12. give you advice about what to do		
13. cheer you up		
14. emphasise your abilities		
15. listen to you		
16. help manage your training sessions		
17. tell you, you can do it		
18. show concern for you		
19. reinforce the positives		
20. make you feel that they would always be there for you		
21. comfort you		
22. boost your confidence		

If you have any further comments on the questionnaire, the items listed, or other important supportive behaviours and message that are not included then please write them below.

_____

_____

_____

THANK FOR YOUR TIME

Study 3 - Translated Content Validity Assessment

本研究主要针对于来自运动员社交网络中的成员（例如：家人，朋友，队友）所给予他（她）们的帮助和支持。您提供的一切信息将仅用于研究目的，您的隐私将得到保证。
请尽量回答所有问题，如果您不确定您的回答，请填上您认为最合理的答案。所有的题目没有正确或者错误之分，我们对任何答案都感兴趣。
首先，请填写以下有关您的信息。

年龄: _____

性别: _____

民族: _____

主要从事的运动: _____

从事了多少年该项运动: _____

运动级别: (请画圈)

娱乐级　　校队级　　地区县市级　　国家级　　国际级

作为研究者来说，我们对运动员能得到的不同种类的资源感兴趣。为此，我们设计了一份问卷表用于测量运动员可能会得到的支持和帮助，这些帮助可以来源于他们的朋友，家人，教练，队友或者队医等。
以下 22 个项目，每个项目将会搭配右边两个纵列中的问题。请阅读每一个项目，在第一个纵列中，请对您理解该项目的程度给予评分：0=完全不能理解，1=只有一点能理解，2=中等程度能理解，3=大部分能理解，4=完全能理解。在第二个纵列，请将您认为该题和运动员的相关性进行评分：0=完全不相关，1=只有一点相关，2=中等程度相关，3=大部分相关，4=完全相关。
在我们的问卷中，所有的项目将会在以下的题干后出现：

在上一周，其他人有多少次的（。。。）

项目	**纵列 1: 理解程度** (0 = 完全不能理解, 1 = 只有一点, 2 = 中等程度, 3 = 大部分, 4 = 完全能理解)	**纵列 2: 相关性** (0 = 完全不相关, 1 = 只有一点, 2 = 中等程度, 3 = 大部分, 4 = 完全相关)
1. 鼓励你		
2. 为你在比赛中表现得更好提出建议		
3. 帮助你计划训练		
4. 给你战术上的指导		
5. 为你去训练和比赛提供交通工具		
6. 为你出主意并教你怎么做		
7. 替你在训练以及比赛中做事情		
8. 教你从正确的角度看待问题		
9. 为你制定并且安排训练内容		
10. 帮你决定要做什么		

11. 帮你完成任务		
12. 为你该做什么提出建议		
13. 为你加油		
14. 认可你的能力		
15. 倾听你的想法		
16. 管理你的训练课程		
17. 告诉你，你一定能做到		
18. 关心你		
19. 肯定你的成绩		
20. 让你感觉到，在你需要帮助的时候，会有人在身边		
21. 安慰你		
22. 帮你提升自信		

如果您认为还有其他一些在体育活动和运动员生涯中非常重要的支持和帮助(不管是实际行动还是口头鼓励和教诲)，请将您的观点写下来：

_____

_____

_____

非常感谢您的参与

Study 3 - Questionnaires

This study focuses on the help and support you have as a sportsperson and your thoughts towards your sport and next competition/match. The information you provide will be used only for the purpose of this research and you will not be identified individually. We will not record your name and contact details, so your confidentiality is assured.

Please answer all the questions in this booklet. 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.

Firstly, please fill out the information about yourself below.

Age: _____

Gender: _____

Ethnic Group: (please circle)

White | Mixed/ Multiple ethnic group | Asian/ Asian British | Black/ African/ Caribbean/ Black British | Other

Nationality: _____

Main sport: _____

Years played that sport: _____

Current competitive level: (please circle)

Recreational | Club | Regional/ County | National | International

Next competition/match will be in: (please circle)

Next 48 hours | Next week | Next month | Next three months | Over three months

How important is that next competition/match: (please circle)

Not at all | A little | Moderately | Quite a bit | Extremely

WHEN YOU HAVE FINISHED PLEASE CHECK YOU HAVE COMPLETED ALL THE QUESTIONS

Over the page is a list of items reflecting the types of help and support you may be provided with as a sportsperson. **This support could come from various people including family, friends, teammates, coaches, fitness trainers etc. in competitions, training, and non-sporting contexts.** Next to each item are two answer columns.

Having read the item, please indicate in the column how frequently you **WANTED** that type of support from people during the last week by ticking the most relevant response option.

☐	☐	☐	☐	☐
Not at all	*Once or twice*	*Three or four times*	*Five or six times*	*Seven or more times*

For all types of support, please tick one response per column.

Item		Wanted				
Please think about interactions with all members of your support network across competitions, training and non-sporting contexts and rate each item in Wanted.		In the last week, how often did you want people…				
		Not at all	Once or twice	3 or 4 times	5 or 6 times	7 or more times
1.	encourage you	☐	☐	☐	☐	☐
2.	give you advice about performing in a competitive situation	☐	☐	☐	☐	☐
3.	help plan your training	☐	☐	☐	☐	☐
4.	give you tactical advice	☐	☐	☐	☐	☐
5.	help with transport to training and competition/matches	☐	☐	☐	☐	☐
6.	offer you ideas and suggest actions	☐	☐	☐	☐	☐
7.	do things for you at training and competition/matches	☐	☐	☐	☐	☐
8.	help you put things in perspective	☐	☐	☐	☐	☐
9.	help set sessions in training	☐	☐	☐	☐	☐
10.	help you decide what to do	☐	☐	☐	☐	☐
11.	help you with tasks	☐	☐	☐	☐	☐
12.	give you advice about what to do	☐	☐	☐	☐	☐
13.	cheer you up	☐	☐	☐	☐	☐
14.	emphasise your abilities	☐	☐	☐	☐	☐
15.	listen to you	☐	☐	☐	☐	☐
16.	help manage your training sessions	☐	☐	☐	☐	☐
17.	tell you, you can do it	☐	☐	☐	☐	☐
18.	show concern for you	☐	☐	☐	☐	☐
19.	reinforce the positives	☐	☐	☐	☐	☐
20.	make you feel that they would always be there for you	☐	☐	☐	☐	☐
21.	comfort you	☐	☐	☐	☐	☐
22.	boost your confidence	☐	☐	☐	☐	☐

Over the page is the same list of items reflecting the types of help and support you may be provided with as a sportsperson. Again we are interested in the **support from various people including family, friends, teammates, coaches, fitness trainers etc. in competitions, training, and non-sporting contexts.** Next to each item are two further answer columns.

Having read the item, please indicate in **column 1** the frequency with which you **RECEIVED** each type of support from people during the last week by ticking the most relevant response option.

☐	☐	☐	☐	☐
Not at all	*Once or twice*	*Three or four times*	*Five or six times*	*Seven or more times*

In **column 2**, please indicate your **SATISFACTION** with the quality of that type of support you have been provided during the last week. Even if you did not receive a certain type of support during the last week, please still rate your level of satisfaction.

☐	☐	☐	☐	☐	☐
Very dissatisfied	*Fairly dissatisfied*	*A little dissatisfied*	*A little satisfied*	*Fairly satisfied*	*Very satisfied*

For all types of support, please tick one response per column.

Item		Received					Satisfaction					
Please think about interactions with all members of your support network across competitions, training and non-sporting contexts and rate each item in terms of Received and Satisfaction.		In the last week, how often did people…					In the last week, how satisfied are you with the quality of support around whether people did…					
		Not at all	Once or twice	3 or 4 times	5 or 6 times	7 or more times	Very dissatisfied	Fairly dissatisfied	A little dissatisfied	A little satisfied	Fairly satisfied	Very satisfied
1.	encourage you	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2.	give you advice about performing in a competitive situation	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3.	help plan your training	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4.	give you tactical advice	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5.	help with transport to training and competition/matches	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6.	offer you ideas and suggest actions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7.	do things for you at training and competition/matches	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8.	help you put things in perspective	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9.	help set sessions in training	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10.	help you decide what to do	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.	help you with tasks	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.	give you advice about what to do	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13.	cheer you up	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
14.	emphasise your abilities	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
15.	listen to you	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
16.	help manage your training sessions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
17.	tell you, you can do it	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
18.	show concern for you	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
19.	reinforce the positives	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
20.	make you feel that they would always be there for you	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
21.	comfort you	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
22.	boost your confidence	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Please read each word below and indicate the extent you feel this *right now, at this moment,* by ticking one response option per question.		**not at all**	**slightly**	**moderately**	**considerably**	**extremely**
1.	Upset	☐	☐	☐	☐	☐
2.	Excited	☐	☐	☐	☐	☐
3.	Nervous	☐	☐	☐	☐	☐
4.	Enthusiastic	☐	☐	☐	☐	☐
5.	Interested	☐	☐	☐	☐	☐
6.	Distressed	☐	☐	☐	☐	☐
7.	Strong	☐	☐	☐	☐	☐
8.	Guilty	☐	☐	☐	☐	☐
9.	Scared	☐	☐	☐	☐	☐
10.	Hostile	☐	☐	☐	☐	☐
11.	Proud	☐	☐	☐	☐	☐
12.	Alert	☐	☐	☐	☐	☐
13.	Ashamed	☐	☐	☐	☐	☐
14.	Inspired	☐	☐	☐	☐	☐
15.	Determined	☐	☐	☐	☐	☐
16.	Attentive	☐	☐	☐	☐	☐
17.	Jittery	☐	☐	☐	☐	☐
18.	Active	☐	☐	☐	☐	☐
19.	Afraid	☐	☐	☐	☐	☐
20.	Irritable	☐	☐	☐	☐	☐

Please indicate how you feel *right now* about your next competition/match by ticking one response option per question.		**not at all**	**somewhat**	**moderately**	**very much so**
1.	I feel self-confident	☐	☐	☐	☐
2.	I'm confident I can meet the challenge	☐	☐	☐	☐
3.	I'm confident about performing well	☐	☐	☐	☐
4.	I'm confident because I can mentally picture myself reaching my goal	☐	☐	☐	☐
5.	I'm confident of coming through under pressure	☐	☐	☐	☐

Thank you very much for your participation!

Study 3 – Translated Questionnaires

本问卷将调查你作为一名运动员在下一场比赛前所获得的帮助和支持以及你的一些想法。你提供的信息将仅用于本研究的学术目的，并且你的个人信息不会被识别。我们不会记录你的名字和联系方式，所以我们能保证你的隐私将得到保护。

请回答下列所有问题。如果你对一些问题的答案不确定，你只需要放上你认为最合理的回答。本问卷中没有所谓的正确或者错误的答案，我们对所有的回答都感兴趣。

首先，请填写你的个人信息。

年龄: _____

性别: _____

民族: _____

主要从事的运动: _____

从事了多少年该项运动: _____

当前运动等级:（请画圈）

娱乐级　　校队级　　地区县市级　　国家级　　国际级

下一场比赛将会在:（请画圈）

48 小时之内　　下星期　　下个月　　3 个月之内　　3 个月之后

下一场比赛的重要性:（请画圈）

完全不重要　　有点重要　　中等程度重要　　比较重要　　非常重要

当完成问卷后，请务必检查你已回答所有的问题

后一页中的 22 个题目描述了你作为运动员可能会得到的帮助。**这些帮助可以来自于不同的人，比如家人、朋友、队友、教练、体能训练师等；并且可以来自于不同场合，比如比赛中，训练中和日常生活中。**在每一个题目旁边的两个纵列将是你分别需要回答的问题

阅读每一个题目，请在该纵列中标出（☑）在上一周，你心里**希望得到**别人对你提供某种帮助的次数。

☐	☐	☐	☐	☐
完全没有	*一到两次*	*三到四次*	*五到六次*	*七到更多次*

对于下表中不同类型的帮助，请在每个纵列中的回答里选择一个打勾。

题目		希望得到 在上一周，你有多少次希望别人。。。				
首先请仔细回忆一下，在比赛、训练和日常生活中，你与你的社交圈里的所有人的互动，并且分别回答你心里希望得到他们帮助你的次数。		完全没有	一到两次	三到四次	五到六次	七到更多次
1.	鼓励你	□	□	□	□	□
2.	为你在比赛中表现得更好提出建议	□	□	□	□	□
3.	帮助你计划训练	□	□	□	□	□
4.	给你战术上的指导	□	□	□	□	□
5.	为你去训练和比赛提供交通工具	□	□	□	□	□
6.	为你出主意并教你怎么做	□	□	□	□	□
7.	替你在训练以及比赛中做事情	□	□	□	□	□
8.	教你从正确的角度看待问题	□	□	□	□	□
9.	为你制定并且安排训练内容	□	□	□	□	□
10.	帮你决定要做什么	□	□	□	□	□
11.	帮你完成任务	□	□	□	□	□
12.	为你该做什么提出建议	□	□	□	□	□
13.	为你加油	□	□	□	□	□
14.	认可你的能力	□	□	□	□	□
15.	倾听你的想法	□	□	□	□	□
16.	管理你的训练课程	□	□	□	□	□
17.	告诉你，你一定能做到	□	□	□	□	□
18.	关心你	□	□	□	□	□
19.	肯定你的成绩	□	□	□	□	□
20.	让你感觉到，在你需要帮助的时候，会有人在身边	□	□	□	□	□
21.	安慰你	□	□	□	□	□
22.	帮你提升自信	□	□	□	□	□

后一页中的 22 个题目描述了你作为运动员可能会得到的帮助。同样地，**这些帮助可以来自于不同的人，比如家人、朋友、队友、教练、体能训练师等；并且可以来自于不同场合，比如比赛中，训练中和日常生活中。**在每一个题目旁边的两个纵列将是你分别需要回答的问题

阅读每一个题目，请在**第一个纵列**中标出（☑）在上一周，你从别人那里**实际获得**的某种帮助的次数。

☐	☐	☐	☐	☐
完全没有	*一到两次*	*三到四次*	*五到六次*	*七到更多次*

在**第二个纵列**中，请标出在上一周，你对于所获得的某种帮助的**满意程度**。即使你可能没有得到任何帮助，但也请你标出（☑）你对此的满意程度。

☐	☐	☐	☐	☐	☐
非常不满意	*比较不满意*	*有点不满意*	*有点满意*	*比较满意*	*非常满意*

对于下表中不同类型的帮助，请在每个纵列中的回答里选择一个打勾。

题目		实际获得 在上一周，其他人有多少次的。。。					满意程度 在上一周，当别人对你（。。。）时，你的满意程度					
首先请仔细回忆一下，在比赛、训练和日常生活中，你与你的社交圈里的所有人的互动，并且分别回答你从他们那里实际获得的帮助的次数，以及当你获得该帮助时的满意程度。		完全没有	一到两次	三到四次	五到六次	七到更多次	非常不满意	比较不满意	有点不满意	有点满意	比较满意	非常满意
1.	鼓励你	□	□	□	□	□	□	□	□	□	□	□
2.	为你在比赛中表现得更好提出建议	□	□	□	□	□	□	□	□	□	□	□
3.	帮助你计划训练	□	□	□	□	□	□	□	□	□	□	□
4.	给你战术上的指导	□	□	□	□	□	□	□	□	□	□	□
5.	为你去训练和比赛提供交通工具	□	□	□	□	□	□	□	□	□	□	□
6.	为你出主意并教你怎么做	□	□	□	□	□	□	□	□	□	□	□
7.	替你在训练以及比赛中做事情	□	□	□	□	□	□	□	□	□	□	□
8.	教你从正确的角度看待问题	□	□	□	□	□	□	□	□	□	□	□
9.	为你制定并且安排训练内容	□	□	□	□	□	□	□	□	□	□	□
10.	帮你决定要做什么	□	□	□	□	□	□	□	□	□	□	□
11.	帮你完成任务	□	□	□	□	□	□	□	□	□	□	□
12.	为你该做什么提出建议	□	□	□	□	□	□	□	□	□	□	□
13.	为你加油	□	□	□	□	□	□	□	□	□	□	□
14.	认可你的能力	□	□	□	□	□	□	□	□	□	□	□
15.	倾听你的想法	□	□	□	□	□	□	□	□	□	□	□
16.	管理你的训练课程	□	□	□	□	□	□	□	□	□	□	□
17.	告诉你，你一定能做到	□	□	□	□	□	□	□	□	□	□	□
18.	关心你	□	□	□	□	□	□	□	□	□	□	□
19.	肯定你的成绩	□	□	□	□	□	□	□	□	□	□	□
20.	让你感觉到，在你需要帮助的时候，会有人在身边	□	□	□	□	□	□	□	□	□	□	□
21.	安慰你	□	□	□	□	□	□	□	□	□	□	□
22.	帮你提升自信	□	□	□	□	□	□	□	□	□	□	□

这是一个由 20 个描述不同情感、情绪的词汇组成的量表，请阅读下列每一个词语，并分别标出（☑）此时此刻你的感受的程度。		一点也不	有一点	中等程度	比较强烈	极其强烈
1.	心烦的	☐	☐	☐	☐	☐
2.	兴高采烈的	☐	☐	☐	☐	☐
3.	紧张的	☐	☐	☐	☐	☐
4.	充满热情的	☐	☐	☐	☐	☐
5.	感兴趣的	☐	☐	☐	☐	☐
6.	心神不宁的	☐	☐	☐	☐	☐
7.	劲头足的	☐	☐	☐	☐	☐
8.	内疚的	☐	☐	☐	☐	☐
9.	惊恐的	☐	☐	☐	☐	☐
10.	有敌意的	☐	☐	☐	☐	☐
11.	自豪的	☐	☐	☐	☐	☐
12.	警觉性高的	☐	☐	☐	☐	☐
13.	羞愧的	☐	☐	☐	☐	☐
14.	备受鼓舞的	☐	☐	☐	☐	☐
15.	意志坚定的	☐	☐	☐	☐	☐
16.	注意力集中的	☐	☐	☐	☐	☐
17.	坐立不安的	☐	☐	☐	☐	☐
18.	有活力的	☐	☐	☐	☐	☐
19.	害怕的	☐	☐	☐	☐	☐
20.	易怒的	☐	☐	☐	☐	☐

下面是运动员通常在赛前对自己的感受所进行的描述。请仔细阅读每一句话，然后用（☑）标出你此刻对于下一场比赛的感受的程度。	一点也不	有一点	中等程度	非常强烈
1. 我感到自己对这场比赛有信心。	□	□	□	□
2. 我自信我能迎接任何挑战。	□	□	□	□
3. 我相信我会在下场比赛中有出色的表现。	□	□	□	□
4. 我有信心是因为在心里已经达到自己的目标。	□	□	□	□
5. 我自信能在各种压力之下完成比赛。	□	□	□	□

非常感谢你的参与！

Study 3 – Syntax of Polynomial Regression Analyses

Note: x = centred received support, y = centred wanted support, m = satisfaction, z1 = self-confidence, z2 = positive affect, z3 = negative affect.

Total effects (using self-confidence as an example):

```
REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS BCOV R
ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT z1
/METHOD=ENTER x y x2 xy y2
```

Bootstrapping of total effects:

```
SET RNG=MT MTINDEX=54321 .
MODEL PROGRAM b0=2.817 b1=.527 b2=-.208 b3=-.151 b4=.183 b5=-.076.
COMPUTE PRED = b0 + b1*x + b2*y + b3*x2 + b4*xy + b5*y2.
CNLR z1
/OUTFILE='C:\Users\fudim\Desktop\CH SC 2way.sav'
/BOOTSTRAP=10000 .
```

Rerun the total effects model, but using satisfaction with support as an outcome (1st stage):

```
REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS BCOV R
ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT m
/METHOD=ENTER x y x2 xy y2
```

Bootstrapping of 1st stage:

```
SET RNG=MT MTINDEX=54321 .
MODEL PROGRAM b0=4.287 b1=.834 b2=-.409 b3=-.325 b4=.072 b5=.055.
COMPUTE PRED = b0 + b1*x + b2*y + b3*x2 + b4*xy + b5*y2.
CNLR m
/OUTFILE='C:\Users\fudim\Desktop\CH 2way 1st.sav'
/BOOTSTRAP=10000 .
```

Direct effects: adding satisfaction with support in the total effects model, the other variables represented their direct effects (2nd stage):

```
REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS BCOV R
ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT z1
/METHOD=ENTER x y x2 xy y2 m
```

Bootstrapping of 2nd stage:

```
SET RNG=MT MTINDEX=54321 .

MODEL PROGRAM b0=1.516 b1=.274 b2=-.084 b3=-.053 b4=.162 b5=-.092
b6=.303.

COMPUTE PRED = b0 + b1*x + b2*y + b3*x2 + b4*xy + b5*y2 + b6*m.

CNLR z1

/OUTFILE='C:\Users\fudim\Desktop\CH SC 2way direct.sav'

/BOOTSTRAP=10000 .
```

Indirect effects: b6 was derived from direct effects model, b0 – b5 was derived from the 1st stage model:

```
COMPUTE Inb0=b0 * b6.

EXECUTE.


COMPUTE Inb1=b1 * b6.

EXECUTE.


COMPUTE Inb2=b2 * b6.

EXECUTE.


COMPUTE Inb3=b3 * b6.

EXECUTE.


COMPUTE Inb4=b4 * b6.

EXECUTE.


COMPUTE Inb5=b5 * b6.

EXECUTE.
```

Bootstrapping of indirect effects model: in the Bootstrap worksheet, enter Inb0 – Inb5 into the regression coefficients rows to replace the original b0 – b5.

Appendix - IV

Study 4 – Time 1 Questionnaires

This study focuses on the help and support you have as a sportsperson and your thoughts towards your sport and an upcoming competition/match. You will be asked to complete an initial set of questionnaires, ideally around one week prior to the competition/match. You will then be asked to complete a second set of questionnaires in the 24 hours prior to the competition/match. The information you provide will be used only for the purpose of this research and you will not be identified individually. Your name is only required to match the two sets of questionnaires, and your e-mail address is only requested so we can contact you about the second set of questionnaires. As such, your confidentiality is assured.

Please answer all the questions in this booklet. 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.

Firstly, please fill out the information about yourself below.

Today's date: _____

Name: _____

e-mail: _____

Age: _____

Gender: (please circle) Female Male

Ethnicity: (please circle) White Mixed Asian Black Others

Main sport: _____

Years played that sport: _____

Current competitive level: (please circle)

Recreational Club Regional/ County National International

Date of next competition/match: _____

How important is that next competition/match: (please circle)

Not at all A little Moderately Quite a bit Extremely

WHEN YOU HAVE FINISHED PLEASE CHECK YOU HAVE COMPLETED ALL THE QUESTIONS

Please indicate how you feel *right now* about your upcoming competition/match by ticking one response option per question.		**not at all**	**somewhat**	**moderately**	**very much so**
1.	I feel self-confident	☐	☐	☐	☐
2.	I'm confident I can meet the challenge	☐	☐	☐	☐
3.	I'm confident about performing well	☐	☐	☐	☐
4.	I'm confident because I can mentally picture myself reaching my goal	☐	☐	☐	☐
5.	I'm confident of coming through under pressure	☐	☐	☐	☐

Please read each word below and indicate the extent you feel this *right now, at this moment, in relation to the upcoming competition/match* by ticking one response option per question.		**not at all**	**slightly**	**moderately**	**considerably**	**extremely**
1.	Upset	☐	☐	☐	☐	☐
2.	Excited	☐	☐	☐	☐	☐
3.	Nervous	☐	☐	☐	☐	☐
4.	Enthusiastic	☐	☐	☐	☐	☐
5.	Interested	☐	☐	☐	☐	☐
6.	Distressed	☐	☐	☐	☐	☐
7.	Strong	☐	☐	☐	☐	☐
8.	Guilty	☐	☐	☐	☐	☐
9.	Scared	☐	☐	☐	☐	☐
10.	Hostile	☐	☐	☐	☐	☐
11.	Proud	☐	☐	☐	☐	☐
12.	Alert	☐	☐	☐	☐	☐
13.	Ashamed	☐	☐	☐	☐	☐
14.	Inspired	☐	☐	☐	☐	☐
15.	Determined	☐	☐	☐	☐	☐
16.	Attentive	☐	☐	☐	☐	☐
17.	Jittery	☐	☐	☐	☐	☐
18.	Active	☐	☐	☐	☐	☐
19.	Afraid	☐	☐	☐	☐	☐
20.	Irritable	☐	☐	☐	☐	☐

Below is a list of items referring to the types of help and support you may be provided with as a sportsperson. This support could come from various people including family, friends, teammates, coaches, fitness trainers etc. in competitions, training, and non-sporting contexts. **Please indicate the frequency with which you want to receive each type of support during the next week by ticking one response option per question.**

During the next week, how often do you want people to…		**Not at all**	**Once or twice**	**3 or 4 times**	**5 or 6 times**	**7 or more times**
1.	encourage you	☐	☐	☐	☐	☐
2.	give you advice about performing in a competitive situation	☐	☐	☐	☐	☐
3.	help plan your training	☐	☐	☐	☐	☐
4.	give you tactical advice	☐	☐	☐	☐	☐
5.	help with transport to training and competition/matches	☐	☐	☐	☐	☐
6.	offer you ideas and suggest actions	☐	☐	☐	☐	☐
7.	do things for you at training and competition/matches	☐	☐	☐	☐	☐
8.	help you put things in perspective	☐	☐	☐	☐	☐
9.	help set sessions in training	☐	☐	☐	☐	☐
10.	help you decide what to do	☐	☐	☐	☐	☐
11.	help you with tasks	☐	☐	☐	☐	☐
12.	give you advice about what to do	☐	☐	☐	☐	☐
13.	cheer you up	☐	☐	☐	☐	☐
14.	emphasise your abilities	☐	☐	☐	☐	☐
15.	listen to you	☐	☐	☐	☐	☐
16.	help manage your training sessions	☐	☐	☐	☐	☐
17.	tell you, you can do it	☐	☐	☐	☐	☐
18.	show concern for you	☐	☐	☐	☐	☐
19.	reinforce the positives	☐	☐	☐	☐	☐
20.	make you feel that they would always be there for you	☐	☐	☐	☐	☐
21.	comfort you	☐	☐	☐	☐	☐
22.	boost your confidence	☐	☐	☐	☐	☐

Thank you very much for your help

Study 4 – Time 2 Questionnaires

This questionnaire follows on from one that you completed approximately one week ago about the support you have as a sportsperson and your thoughts towards an upcoming competition/match. Please answer all the questions in this booklet. 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. To help us match your answers with the questionnaire you have completed last week, please write down your name.

Name:_____

Today's date:_____

Date of next competition/match:_____

WHEN YOU HAVE FINISHED PLEASE CHECK YOU HAVE COMPLETED ALL THE QUESTIONS

THANK YOU

Over the page is a list of items reflecting the types of help and support you may be provided with as a sportsperson. **This support could come from various people including family, friends, teammates, coaches, fitness trainers etc. in competitions, training, and non-sporting contexts.** Next to each item are three answer columns.

Having read the item, please indicate in **column 1**, how frequently you **REQUESTED** that type of support from people during the last week.

A	B	C	D	E
Not at all	*Once or twice*	*Three or four times*	*Five or six times*	*Seven or more times*

In **column 2,** please indicate the frequency with which you **RECEIVED** each type of support from people during the last week.

A	B	C	D	E
Not at all	*Once or twice*	*Three or four times*	*Five or six times*	*Seven or more times*

In **column 3**, please indicate your **SATISFACTION** with the quality of that type of support you have been provided during the last week. Even if you did not receive a certain type of support during the last week, please still rate your level of satisfaction.

0	1	2	3	4	5
Very dissatisfied	*Fairly dissatisfied*	*A little dissatisfied*	*A little satisfied*	*Fairly satisfied*	*Very satisfied*

For all types of support, please circle one response per column.

Item		Requested	Received	Satisfaction
Please think about interactions with all members of your support network across competitions, training and non-sporting contexts and rate each item in terms of Requested, Received, and Satisfaction.		**In the last week, how often did you request people…** *A = Not at all to E = Seven or more times*	**In the last week, how often did people…** *A = Not at all to E = Seven or more times*	**In the last week, how satisfied are you with the quality of support around whether people did…** *0 = Very dissatisfied to 5 = Very satisfied*
1.	encourage you	A B C D E	A B C D E	0 1 2 3 4 5
2.	give you advice about performing in a competitive situation	A B C D E	A B C D E	0 1 2 3 4 5
3.	help plan your training	A B C D E	A B C D E	0 1 2 3 4 5
4.	give you tactical advice	A B C D E	A B C D E	0 1 2 3 4 5
5.	help with transport to training and competition/matches	A B C D E	A B C D E	0 1 2 3 4 5
6.	offer you ideas and suggest actions	A B C D E	A B C D E	0 1 2 3 4 5
7.	do things for you at training and competition/matches	A B C D E	A B C D E	0 1 2 3 4 5
8.	help you put things in perspective	A B C D E	A B C D E	0 1 2 3 4 5
9.	help set sessions in training	A B C D E	A B C D E	0 1 2 3 4 5
10.	help you decide what to do	A B C D E	A B C D E	0 1 2 3 4 5
11.	help you with tasks	A B C D E	A B C D E	0 1 2 3 4 5
12.	give you advice about what to do	A B C D E	A B C D E	0 1 2 3 4 5
13.	cheer you up	A B C D E	A B C D E	0 1 2 3 4 5
14.	emphasise your abilities	A B C D E	A B C D E	0 1 2 3 4 5
15.	listen to you	A B C D E	A B C D E	0 1 2 3 4 5
16.	help manage your training sessions	A B C D E	A B C D E	0 1 2 3 4 5
17.	tell you, you can do it	A B C D E	A B C D E	0 1 2 3 4 5
18.	show concern for you	A B C D E	A B C D E	0 1 2 3 4 5
19.	reinforce the positives	A B C D E	A B C D E	0 1 2 3 4 5
20.	make you feel that they would always be there for you	A B C D E	A B C D E	0 1 2 3 4 5
21.	comfort you	A B C D E	A B C D E	0 1 2 3 4 5
22.	boost your confidence	A B C D E	A B C D E	0 1 2 3 4 5

Please indicate how you feel *right now* about your upcoming competition/match by ticking one response option per question.		**not at all**	**somewhat**	**moderately**	**very much so**
1.	I feel self-confident	☐	☐	☐	☐
2.	I'm confident I can meet the challenge	☐	☐	☐	☐
3.	I'm confident about performing well	☐	☐	☐	☐
4.	I'm confident because I can mentally picture myself reaching my goal	☐	☐	☐	☐
5.	I'm confident of coming through under pressure	☐	☐	☐	☐

Please read each word below and indicate the extent you feel this *right now, at this moment, in relation to the upcoming competition/match* by ticking one response option per question.		**not at all**	**slightly**	**moderately**	**considerably**	**extremely**
1.	Upset	☐	☐	☐	☐	☐
2.	Excited	☐	☐	☐	☐	☐
3.	Nervous	☐	☐	☐	☐	☐
4.	Enthusiastic	☐	☐	☐	☐	☐
5.	Interested	☐	☐	☐	☐	☐
6.	Distressed	☐	☐	☐	☐	☐
7.	Strong	☐	☐	☐	☐	☐
8.	Guilty	☐	☐	☐	☐	☐
9.	Scared	☐	☐	☐	☐	☐
10.	Hostile	☐	☐	☐	☐	☐
11.	Proud	☐	☐	☐	☐	☐
12.	Alert	☐	☐	☐	☐	☐
13.	Ashamed	☐	☐	☐	☐	☐
14.	Inspired	☐	☐	☐	☐	☐
15.	Determined	☐	☐	☐	☐	☐
16.	Attentive	☐	☐	☐	☐	☐
17.	Jittery	☐	☐	☐	☐	☐
18.	Active	☐	☐	☐	☐	☐
19.	Afraid	☐	☐	☐	☐	☐
20.	Irritable	☐	☐	☐	☐	☐

Thank you very much for your help

Study 4 – Syntax of Polynomial Regression Analyses

Note: x = centred received support, y = centred wanted support, w = requested support, m = satisfaction, z11 = time 1 self-confidence, z21 = time 1 positive affect, z31 = time 1 negative affect, z1 = time 2 self-confidence, z2 = time 2 positive affect, z3 = time 2 negative affect.

Total effects (using positive affect as an example):

```
REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS BCOV R
ANOVA CHANGE
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT z2
/METHOD=ENTER z21
/METHOD=ENTER x y x2 xy y2
/METHOD=ENTER x y x2 xy y2 w wx wy wx2 wxy wy2
```

Bootstrapping of total effects:

```
SET RNG=MT MTINDEX=54321 .
MODEL PROGRAM b0=2.375 b1=-.197 b2=.674 b3=-.495 b4=.686 b5=.003 b6=-.171 b7=.231 b8=-.228 b9=.084 b10=-.156 b11=-.033 b12=.482.
COMPUTE PRED = b0 + b1*x + b2*y + b3*x2 + b4*xy + b5*y2 + b6*w + b7*wx + b8*wy + b9*wx2 + b10*wxy + b11*wy2 + b12*z21.
CNLR z2
/OUTFILE='C:\Users\fudim\Desktop\3way total pa.sav'
/BOOTSTRAP=10000 .
```

Rerun the total effects model, but using satisfaction with support as an outcome (1st stage):

```
REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS BCOV R
ANOVA CHANGE
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT m
/METHOD=ENTER z21
/METHOD=ENTER x y x2 xy y2
/METHOD=ENTER x y x2 xy y2 w wx wy wx2 wxy wy2
```

Bootstrapping of 1st stage:

```
SET RNG=MT MTINDEX=54321 .
MODEL PROGRAM b0=4.773 b1=-.345 b2=.665 b3=-.689 b4=1.319 b5=-.192 b6=-.387 b7=.353 b8=-.171 b9=.181 b10=-.357 b11=.015 b12=.213.
COMPUTE PRED = b0 + b1*x + b2*y + b3*x2 + b4*xy + b5*y2 + b6*w + b7*wx + b8*wy + b9*wx2 + b10*wxy + b11*wy2 + b12*z21.
CNLR m
/OUTFILE='C:\Users\fudim\Desktop\3way 1st pa.sav'
/BOOTSTRAP=10000 .
```

Direct effects: adding satisfaction with support in the total effects model, the other variables represented their direct effects (2nd stage):

```
REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS BCOV R
ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT z2
/METHOD=ENTER z21 x y x2 xy y2 w wx wy wx2 wxy wy2 m
```

Bootstrapping of 2nd stage:

```
SET RNG=MT MTINDEX=54321 .
MODEL PROGRAM b0=1.181 b1=-.111 b2=.507 b3=-.322 b4=.356 b5=.052 b6=-
.074 b7=.143 b8=-.186 b9=.039 b10=-.067 b11=-.037 b12=.429 b13=.250.
COMPUTE PRED = b0 + b1*x + b2*y + b3*x2 + b4*xy + b5*y2 + b6*w + b7*wx +
b8*wy + b9*wx2 + b10*wxy + b11*wy2 + b12*z21 + b13*m.
CNLR z2
/OUTFILE='C:\Users\fudim\Desktop\3way direct pa.sav'
/BOOTSTRAP=10000 .
```

Indirect effects: b13 was derived from direct effects model, b0 – b12 was derived from the 1st stage model:

```
COMPUTE Inb0=b0 * b13.
EXECUTE.

COMPUTE Inb1=b1 * b13.
EXECUTE.
```

```
COMPUTE lnb2=b2 * b13.
EXECUTE.

COMPUTE lnb3=b3 * b13.
EXECUTE.

COMPUTE lnb4=b4 * b13.
EXECUTE.

COMPUTE lnb5=b5 * b13.
EXECUTE.

COMPUTE lnb6=b6 * b13.
EXECUTE.

COMPUTE lnb7=b7 * b13.
EXECUTE.

COMPUTE lnb8=b8 * b13.
EXECUTE.

COMPUTE lnb9=b9 * b13.
EXECUTE.

COMPUTE lnb10=b10 * b13.
EXECUTE.

COMPUTE lnb11=b11 * b13.
```

```
EXECUTE.

COMPUTE Inb12=b12 * b13.
EXECUTE.
```

To calculate coefficients of total, direct, and indirect effects model, when requested low levels of support (one SD below the mean = 1.4), the following calculations were conducted, respectively:

```
COMPUTE lb0=b0 + (b6 * 1.4).
EXECUTE.

COMPUTE lb1=b1 + (b7 * 1.4).
EXECUTE.

COMPUTE lb2=b2 + (b8 * 1.4).
EXECUTE.

COMPUTE lb3=b3 + (b9 * 1.4).
EXECUTE.

COMPUTE lb4=b4 + (b10 * 1.4).
EXECUTE.

COMPUTE lb5=b5 + (b11 * 1.4).
EXECUTE.
```

To calculate coefficients of total, direct, and indirect effects model, when requested high levels of support (one SD above the mean = 3.2), the following calculations were conducted, respectively:

```
COMPUTE hb0=b0 + (b6 * 3.2).
EXECUTE.

COMPUTE hb1=b1 + (b7 * 3.2).
EXECUTE.

COMPUTE hb2=b2 + (b8 * 3.2).
EXECUTE.

COMPUTE hb3=b3 + (b9 * 3.2).
EXECUTE.

COMPUTE hb4=b4 + (b10 * 3.2).
EXECUTE.

COMPUTE hb5=b5 + (b11 * 3.2).
EXECUTE.
```

Bootstrapping of indirect effects model: in the Bootstrap worksheet, enter Inb0 – Inb5 at the low and high levels of requested support respectively into the regression coefficients rows to replace the original b0 – b5.