

Attachment and Performance Under Pressure
On a
Sport Motor Task

by

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Abstract

Attachment theory (Bowlby, 1969/1982, 1973, 1980) asserts that people are born with an innate psychobiological system (the attachment behavioural system) motivating them to seek proximity with significant others (attachment figures) in times of distress. Individual differences in attachment can be measured along two dimensions; *avoidance* and *anxiety*, representing the degree to which hyperactivating or deactivating strategies are used as alternative strategies for regulating emotion. People who score low on both dimensions are considered more *securely attached*, while higher scores on either or both dimensions reflects more *attachment insecurity*. Forrest (2008) proposed that insecurely attached athletes might be more susceptible to performance deficits under competitive stress compared to securely attached athletes. This study examined whether attachment orientation would predict performance under pressure on a sport motor task. Sixty-four competitive basketball players shot 20 free throws under low and high pressure. It was hypothesized that attachment orientation to parental figures and closest teammate would predict performance changes. Regression analyses showed that attachment orientation was not a significant predictor of performance change under pressure. However, the manipulation check revealed that competitive anxiety did not sufficiently increase from low pressure to high pressure, and significant changes in performance between conditions were not found. This may suggest that the manipulation of high pressure was not realistic or severe enough to threaten the attachment behavioural system in competitive athletes. Results showed that athletes' attachment orientation to mother correlated with attachment orientation to their closest teammate. Discussion surrounds the difficulty of manipulating pressure in sport research as well as avenues for future research on attachment and sport performance. Key words: attachment, performance pressure, free throw, teammate.

Preface: Attachment and Performance Under Pressure in Sport

When experiences with attachment figures are perceived as supportive and responsive, people are likely to develop and carry with them a sense of *attachment security*; commonly evidenced by seeking proximity with attachment figures in times of need and generally using constructive strategies (e.g., help-seeking, problem focused coping) to regulate emotions (Carr, 2012; Ein-Dor, Reizer, Shaver & Dotan, 2012; Mikulincer & Shaver, 2016). On the other hand, when attachment figures are perceived as unreliable, unavailable, or unsupportive, people can become *insecurely attached*, manifested in a generalized belief in a non-supportive world, mistrust, and emotional inflexibility, using different coping strategies (e.g., avoidance and/or emotion focused coping) in times of stress (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1973; Ein-Dor, Mikulincer, Doron, & Shaver, 2010; Ein-Dor et al., 2012; Fonagy & Target, 2002; Main, 2000; Mikulincer & Shaver, 2016). In the attachment literature, individual differences are conceptualized and referred to as one's *attachment orientation*, *attachment style* or *attachment state of mind*, which have been linked to a variety of differences related to interpersonal functioning, mental health and wellness (e.g., Carr, 2012a; Hill, Hanton, Matthews & Flemming, 2011; Mikulincer & Shaver, 2016; Schore, 2001). People who consciously or unconsciously use *deactivating strategies* are broadly referred to, as *avoidant* with respect to attachment, while those who consciously or unconsciously use *hyperactivating strategies*, are broadly labelled *anxious* with respect to their attachment. People who rarely use either strategy are considered *securely attached*.

Individual differences in attachment have been shown to influence how people appraise, respond and attend to both attachment and non-attachment related threats (e.g., Dewitte et al., 2007; Gillath, Giesbrecht & Shaver, 2009; Fonagy & Target, 2002; Main,

2000; Ein-Dor et al., 2010; Fraley, Neidenthal, Marks, Brubaugh & Vicary, 2006; Mikulincer, Gillath & Shaver, 2002; Mikulincer, Tolev & Shaver, 2004; Mikulincer & Shaver, 2016; Van Emmichoven, Van Ijzendoorn, De Ruiter, & Brosschot, 2003). Forrest (2008) proposed that, applying an attachment-based perspective to sport would suggest that insecurely attached athletes may have an increased susceptibility of experiencing performance deficits due to differences in their self-regulation strategies and impaired attentional flexibility under competitive stress (Carr, 2012a; Forrest, 2008). The current project aimed to investigate this possibility and further explore the impact of attachment theory in sport (Carr, 2009a; 2009b; 2012a; 2012b; Davis & Jowett 2010; Dizdari, Bunke & Psouni, 2013; Felton & Jowett, 2013; 2015; Sukys, Lisinskiene & Tilindiene, 2015) by examining whether attachment orientation is a predictor of performance on a well-learned sport motor task. The implications of this project hope to aid in the discovery of ways that attachment related 'buffering' strategies (Bowlby, 1988; Gillath, Hart, Nofle & Stockdale, 2009; Mikulincer & Shaver, 2017; Rom & Mikulincer, 2003) might enhance sport performance, and in turn, help to maintain sport satisfaction, participation, and the mental health and well-being of athletes (Carr, 2009a; 2009b; 2012a; 2012b; Felton & Jowett, 2014; Forrest, 2008).

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Chapter 1: Review of Literature

Attachment Theory

Attachment theory (Bowlby, 1969, 1979, 1980, 1988) is a multifaceted theory of personality, functioning and development that views early childhood relationships as gravely important in training emotion regulation, and our behaviours and experiences in close relationships (Carr, 2012a; Fonagy & Target, 2002; Mikulincer & Shaver, 2016). The theory is an attempt to explain how secure attachments help people to manage confrontations with temporary bouts of negative emotions (Mikulincer & Shaver, 2016). It provides a rationale for the ways in which all humans similarly respond to threats (normative attachment functioning) as well as why individual differences in threat response often emerge (individual differences in attachment functioning) (Carr, 2012a; Mikulincer & Shaver, 2016). Attachment theory explains how relationships contribute to an individual's sense of security and how this can mitigate emotion regulation, social adjustment and mental health (Mikulincer & Shaver, 2016).

Background of Attachment Theory

Bowlby's stages of separation. John Bowlby's (1907-1990) life work was set on course while he was a volunteer at a school for maladjusted children, where he observed the behavioural patterns of two young boys (Mikulincer & Shaver, 2016). One boy was a very remote, withdrawn and affectionless teenager, who had no stable mother figure, while the other, was a young anxious child who never left Bowlby's side and who people referred to as his shadow (Bretherton, 1992; Mikulincer & Shaver, 2016). These different reactions to inadequate parenting inspired Bowlby to understand the development of what today is called anxious and avoidant 'attachment styles' (Mikulincer & Shaver, 2016). Later in his career, Bowlby, observed that when toddlers were forcefully separated from

their parents (e.g., due to the child's or parent's hospitalization) they displayed behavioural patterns that seemed to be dependent on the length of time of the separation (Main, 2000; Mikulincer & Shaver, 2016). Subsequently, in a series controlled studies, Bowlby and colleagues observed how toddlers behaved in unfamiliar surroundings (see Bowlby, 1973), Bowlby and his colleagues found that children seem to progress through three increasingly "unfavourable stages" (Main, 2000, p. 1061) in response to being separated from their caregivers. These stages were later called *protest*, *despair* and *detachment* (Bowlby, 1973; Main, 2000).

Protest, characterized by hopeful and persistent calling out and crying for caregivers, and an overall preoccupation with the caregivers' whereabouts, began shortly after the separation (Main, 2000). After a day or two, the *hopeful* crying receded to *hopeless* crying and the children became lethargic, withdrawing interest from the surrounding environment, seemingly in *despair* (Main, 2000). Lastly, in the stage of *detachment*, children were observed attending once again to their surrounding environment (e.g., nurses and other children). Initially, these behaviours were believed to be a positive sign that the children were adapting to their new conditions (Main, 2000). However, children who reached this detached stage would actively ignore and avoid their primary caregiver upon reunion, almost as if the caregiver was unrecognizable (Main, 2000).

What Bowlby and his colleagues observed was that the detached children only acted this way toward their *primary* caregiver (i.e., their attachment figure), whereas they still greeted and seemed to remember other important and familiar people (e.g., other parents, relatives and neighbours). This distinction pointed to repressive processes rather than lapses in the child's memory (Main, 2000). The stages of separation were found to

last anywhere from a few days to a few months (Main, 2000). Although most of Bowlby's work focused initially on maternal deprivation and the child-caregiver relationship (Hudson, Fraley, Chopik, Heffernan, 2015; Mikulincer & Shaver, 2016), over his career he came to see how *attachment* is a fundamental feature characterizing human social and emotional experiences across the life span, or "from the cradle to the grave" (Bowlby, 1969, p. 208; Hudson et al., 2015). The behaviours associated with these stages of separation, reflect the state, development and functioning of what Bowlby (1969, 1973, 1980) came to call the *attachment behavioural system* (Main, 2000). The extent to which the development and functioning of the attachment behavioural system influences behaviours in adulthood has inspired a plethora of research.

The Attachment Behavioural System

'Proximity seeking' and 'felt security'. One of the central concepts of attachment theory surrounds the existence of the *attachment behavioural system* (Bowlby, 1969/1982, 1973, 1980), an inborn psychobiological system that motivates human beings (among other mammalian species) to establish emotional bonds with stronger and wiser caregivers, and to maintain or *seek proximity* with those caregivers in times of distress or perceived threat (Carr, 2012a; Ein-Dor et al., 2010; Fonagy & Target, 2002; Main, 2000; Mikulincer, 1995; Mikulincer & Shaver, 2016). Since vulnerability and dependency are extreme in human infancy, the attachment behavioural system evolved out of an evolutionary advantage that is gained by maintaining close relationships (Bowlby, 1969, 1973). This advantage eventually equipped human beings with a repertoire of attentional and behavioural functions that aim to initialize the formation of an emotional bonds with supportive caregivers (Bowlby, 1969/1982, 1973, 1980; Ein-Dor et al., 2010; Mikulincer, Gillath & Shaver, 2002; Mikulincer & Shaver,

2016). For example, emotionally charged, innate behavioural patterns, such as crying, smiling and clinging, were designed in part to help establish a strong emotional bond with a protective caregiver. These behaviours exist as “nature’s insurance” (Bowlby, 1979/2005, p.51) that relationships facilitate rather than risking the development purely as a result of learning (Bowlby, 1982; Carr, 2012a). Bowlby (1982) called primary supportive caregivers *attachment figures*, and believed that the sense of security and protection they provide in times of need works to deactivate the attachment behavioural system to its homeostasis.

Bowlby (1969, 1973) also believed that the sense of protection and security provided by attachment figures (later termed “felt security” by Sroufe & Waters, 1977, p. 3), not only restored regular homeostatic functioning, but also simultaneously encourages the attached person to confidently and autonomously explore their environment in pursuit of goals that are unrelated to the relationship. Mikulincer and Shaver (2016) have described felt security as:

a psychological state that has many implications: Feeling secure, a person can devote attention to matters other than self-protection; being well cared for, he can appreciate the feeling being loved and valued; in some circumstances he can take risks, being confident that help is readily available (p.14).

Thus, the attachment behavioural systems’ job or goal of maintaining felt security by establishing a protective emotional relationship with a reliable and supportive caregiver also dually propels autonomous exploration and risk taking. Maintaining attachment relationships and autonomous exploration are both understood to be evolutionary advantageous behaviours because they increase the chances that humans will eventually

reproduce and survive (Bowlby, 1969/1982, 1973, 1980; Ein-Dor et al., 2010; Main, 2000; Mikulincer et al., 2002; Mikulincer & Shaver, 2016). Thus, attachments are highly influential to our personal development as a result of the biological roots of the attachment behaviour system and the evolutionary advantages that evolved from maintaining close relationships with attachment figures (Bowlby, 1969/1982; Carr, 2012a; Sroufe & Waters, 1977; Ein-Dor et al., 2010; Mikulincer & Shaver, 2016).

Although the behaviours motivated by the attachment behavioural system, (e.g., seeking or maintaining proximity with attachment figures during times of threat), are most easily observable, and arguably most important in terms of development, in childhood (Bowlby, 1988, Fonagy & Target, 2002), the attachment behavioural system remains active and influential across the lifespan and is “manifested in thoughts and behaviours related to maintaining and seeking proximity to attachment figures in times of need” (Mikulincer et al., 2002, p. 881). *Proximity*, therefore, does not necessarily mean physical proximity (Bowlby, 1973; Mikulincer et al., 2002). Rather, as the person matures into adulthood, proximity in the attachment sense refers to their belief and confidence that attachment figures are interested, responsive and able to provide emotional support and comfort when needed (Bowlby, 1969/1982, 1973, 1988; Mikulincer & Shaver, 2016). It is the individual’s confidence in the ability and availability of attachment figures to provide quality support that leads to the attainment of felt security during times of need, and simultaneously deactivates the attachment behavioural system (Ein-Dor et al, 2010; Mikulincer & Shaver, 2016). Therefore, in adulthood, felt security is attained through increasing physical proximity with an attachment figure *or* utilizing symbolic proximity (e.g., mental representations) of attachment figures (Mikulincer et al., 2002; Mikulincer & Shaver, 2016). Thus, the

cognitive or behavioural changes associated with the attachment behavioural system are not always observable (Mikulincer, Dolev & Shaver, 2004; Mikulincer & Shaver, 2016) and “can operate in the adult mind either unconsciously or consciously, and either deliberately or automatically” (Mikulincer & Shaver, 2016, p. 28).

The attachment behavioural system is considered to be one link in an “interrelated group of behavioural systems that serve the overarching objective of maintaining a sense of homeostasis between individual and environment” (Carr, 2012a, p. 10). In addition to the other ‘outer ring’ life-maintaining homeostatic systems, the attachment behavioural system functions on a familiarity-strangeness parameter that is in place to protect the ‘inner ring’ of physiological systems (Carr, 2012a). Essentially, the familiarity-strangeness parameter equates familiarity with safety and excessive strangeness or unfamiliarity with threat. When no threats are perceived, proximity seeking to attachment figures is not necessary because protection is not required. When there is no threat present, a desire for proximity with an attachment figure can occur out of motivation from another behavioural system (such as reproduction or affiliation). However, when the attachment behavioural system *is* activated by threat, motivations from other behavioural systems are allegedly overridden, due to the evolutionary importance of protection by attachment figures as a means of survival (Bowlby, 1969, 1973; Mikulincer & Shaver, 2016).

Triggers and ‘natural clues of danger’. When actual danger or potential threats are perceived, the attachment behavioural system becomes activated and proximity seeking for attachment figures ensues. Once proximity with attachment figures has been established, the attachment system is deactivated as the threat is no longer perceived as threatening or is sufficiently diminished by the feelings of felt security or actual

proximity provided by an attachment figure (Bowlby; 1973; Carr, 2012a; Mikulincer et al., 2002; Mikulincer & Shaver, 2016). For example, when an infant or young child is left alone, he or she may begin to visually search or call out for their caregiver. The child's goal is to re-establish or regain physical proximity (or at least visual contact) in order to restore their feelings of safety and security and to reduce the emotional response from the perceived threat of vulnerability (Bowlby, 1973; Main, 2000; Mikulincer & Shaver, 2016).

Although Bowlby (1969) originally believed that the attachment behavioural system would only become activated when a person was confronted an environmental danger, he quickly extended this rationale to include what he called 'natural clues of danger' (Bowlby, 1973), realizing that perceptions of impending threat can also trigger activation. Natural clues of danger are "stimuli that are not inherently dangerous but that increase the likelihood of danger (e.g., darkness, loud noises) as well as by attachment-related threats such as impending or actual separation from, or loss of an attachment figure" (Mikulincer & Shaver, 2016, p. 11). Thus, Bowlby (1969, 1973, 1988) believed that actual threats *or* signals of threat would activate the attachment behavioural system. These triggers could be specifically attachment related, such as a separation from or loss of an attachment figure (e.g., conflict, bereavement, romantic breakup), non-attachment related such as unexpected, strange and unfamiliar situations, fear, fatigue or illness, or other 'signals of danger' that may indirectly threaten wellbeing, safety, or separation from an attachment figure (Bowlby, 1973; Carr, 2012a; Mikulincer & Shaver, 2016).

Bowlby (1973) believed that combinations of these kinds of stressors could create compounded distress, or a *compound situation*. Compound situations are rationed to trigger the highest level of attachment behavioural system activation especially when

attachment figures are not physically present or are perceived as unavailable/unable to provide felt security (Bowlby, 1973; Main, 2000; Mikulincer & Shaver, 2016). The greater the level stress, the greater activation or alarm ignited by the attachment behavioural system. Moreover, the amount of proximity needed to deactivate the attachment behavioural system once it has been activated depends on the intensity and severity of the perceived threat (e.g., whether it is a compound situation (multiple stressors), the duration and level of emotional response and associated physical arousal, the individuals' age, the immediacy at which proximity is sought) (Bowlby, 1973, 1988; Carr, 2012a; Mikulincer & Shaver, 2016). Compound situations and more severe threats will intensify or prolong the attachment behavioural system's response, and will initiate stronger proximity seeking behaviours (e.g., seeking physical proximity rather than mental representations of felt security) or require longer proximity with attachment figures until the individual's homeostatic level of felt security is restored.

Attachment Figures

'Attachment bonds' and 'attachment interactions'. Not all close relationships are attachment relationships, and not all interactions with attachment figures are attachment interactions (Bowlby, 1982; Mikulincer et al., 2002; Mikulincer & Shaver, 2016). For example, playing a game or spending time with an attachment figure may strengthen an existing attachment bond, but are not circumstances where one relies on an attachment figure for protection and comfort when they are distressed (Mikulincer & Shaver, 2016). Attachment relationships are different from other close or significant relationships, or caregiving relationships, in that they must involve an *attachment bond* (Bowlby 1969/1982), which may not always be evident because "when neither partner is threatened, demoralized, or in need, the two may seem quite autonomous, and their

interactions may be more affiliative, exploratory, or sexual than attachment oriented” (Mikulincer & Shaver, 2016, p. 17). Other emotional bonds based on common interest, familiarity, biological relatedness and respect are different from attachment bonds in that, when they are threatened or broken, the distress does not equate the severing of an attachment relationship (Mikulincer & Shaver, 2016). Importantly, attachment relationships involve proximity seeking in times of need (Mikulincer et al., 2002). Additionally, it is important to point out that parents are not *attached* to their child in the way that their child is attached to them. Rather, they are bonded to their children as *caregivers* (according to attachment theory, caregiving is motivated by another behavioural system) and are not reliant on them (at least when their children are young) for protection (Mikulincer & Shaver, 2016). When a parent *is* attached to their child in the attachment sense (i.e., used for protection or felt security) when children are young, it is quite often damaging to the child’s sense of felt security over time (Mikulincer & Shaver, 2016).

“Secure base” and “safe haven”. Attachment bonds do not transpire overnight and attachment figures may not even be evident until distress is encountered (Bowlby, 1973, 1982; Fonagy & Target, 2002; Mikulincer & Shaver, 2016). Bowlby (1982) described attachment figures as the hierarchical select few who over time the child or adult “is strongly disposed to seek proximity to and contact with, and to do so in certain specified conditions” (p. 669). Infants and children will demonstrate specific behaviours and a strict preference for attachment figures compared to other familiar people, whereby their attachment system, once activated, is only deactivated by gaining proximity to those with whom they are attached (Bowlby, 1982; Main, 2000). Bowlby’s colleague Mary Ainsworth, is credited with contributing many ideas to attachment theory, but is

especially known for her conceptualization of the attachment figure as a *secure base* (Bowlby, 1988; Ainsworth et al., 1978; Mikulincer & Shaver, 2016). Compared with other caregivers or people whom we are emotionally close too, attachment figures are distinct in that they operate as a *secure base* by providing support and encouragement that allows the child (or adult) to feel secure enough to confidently distance themselves physically and emotionally from that secure base, and allows them to focus their attention on exploring the environment in autonomous pursuit of goals (e.g., Bowlby; 1988; Carr, 2012a; Main, 2000; Mikulincer & Shaver, 2016; 2017). Attachment figures also act as a *safe haven*, by being a reliable retreat in times of concern or threat and providing relief, protection and comfort for the attached person (e.g., Bowlby, 1988; Carr, 2012a; Mikulincer & Shaver, 2017). In infancy and childhood, it is most often the case that our primary caregivers (e.g., parents) become our initial attachment figures and represent our “primary solution to experiences of fear” (Main, 2000, p.1055).

The status of attachment behavioural system and quality of attachment bonds will influence the extent to which people explore their environment with curiosity and confidence, how much they feel the need to avoid or withdraw from situations that are unfamiliar or new, and subsequently, the development of sequential cognitive-behavioural patterns associated with general or specific confrontations with stress or threat (Carr, 2012a; Ein-Dor et al, 2010; Mikulincer & Shaver, 2016). As Mikulincer and Shaver (2016) point out:

“When a relationship partner is available, sensitive and responsive to an individual’s proximity-seeking efforts in times of need, the individual is likely to experience felt security –a sense that the world is generally safe, that attachment figures

are helpful when called upon, and that it is possible to explore the environment curiously and confidently and to engage rewardingly with other people” (p. 19).

If an individual begins experiencing this general sense of felt security in childhood it implies that proximity seeking is an effective emotion regulation strategy and provides vital procedural knowledge about distress management (Mikulincer & Shaver, 2016). Conversely, if the attachment behavioural system’s set-goal felt security is not frequently attained through proximity seeking as a result of caregiver or attachment figure unavailability *or* inconsistency, over time individuals may adaptively develop *secondary attachment strategies* to replace this primary strategy (i.e. proximity seeking) (Ein-dor et al., 2010). Thus, the development and implementation of secondary attachment strategies are circumventing attempts to deactivate the attachment behavioural system by means other than proximity seeking.

Secondary Attachment Strategies

‘Hyperactivation’ and ‘deactivation’. The fight-flight distinction in physiological psychology (Cannon, 1932/1939) has been rationed to underlie the foundation and development of secondary attachment strategies (Ein-Dor et al., 2010; Mikulincer & Shaver, 2016) *Hyperactivating* attachment strategies are ‘fight’ responses (similar to Bowlby’s ‘protest’ stage behaviours) against the frustration of unmet attachment needs (Main, 2000; Mikulincer & Shaver, 2016). Individuals who adapted to using hyperactivating strategies were likely exposed to relationships (in early childhood) with a “partial reinforcement schedule that rewards persistent and energetic proximity-seeking attempts” (Mikulincer & Shaver, 2016, p. 21). More specifically, hyperactivation strategies aim at getting an attachment figure who is perceived to be insufficiently responsive or unreliable to provide better support and attention, and thus, intensifies

emotional responses to threat and proximity seeking or maintenance attempts through persistent or forceful behaviours in order to attain felt security. Likely, this strategy became reinforced because on some occasions it was actually successful in attaining felt security (Mikulincer & Shaver, 2016). However, using these often over zealous tactics to gain support and attention begin to seem/feel both “natural and necessary, and they can become a cause for further relationship conflicts and emotional distress” (Mikulincer & Shaver, 2016, p. 20).

On the other hand, attachment-system *deactivating* strategies are ‘flight’ reactions to attachment figure unavailability (Mikulincer & Shaver, 2016). Using attachment system deactivating strategies is believed to have developed through experiences in early relationships where closeness and expressions of vulnerability were disapproved of or punished (Main, 1990; Mikulincer & Shaver, 2016). The use of deactivation strategies came to adaptively replace the primary strategy of proximity seeking because better outcomes (i.e., emotion regulation) were experienced when signs of need and vulnerability were hidden from attachment figures, despite feelings of felt security not often being attained (Mikulincer & Shaver, 2016). Thus, the attached person learns to suppress and avoid attachment system activation. Likely it was the case that caregivers or attachment figures were *consistently* unavailable or *unable* to comfort the attached person (for various reasons), and as such, in using this down regulation strategy, the person learned that to deal with attachment system activation alone. People who have learned to use deactivating strategies often develop a compulsive self-reliance and a ‘denial of need’ rationale, as a way of keeping the attachment system deactivated (Mikulincer & Shaver, 2016).

In the same fashion as proximity seeking, secondary strategies also aim to deactivate the attachment behavioural system and remove the associated emotional response from a lack of perceived attachment figure availability, ability or reliability, and can essentially replace the primary strategy (Ein-Dor et al., 2010; Mikulincer & Shaver, 2016). Bowlby (1969, 1973) believed that secondary attachment strategies were adaptive attempts to learn from past experiences that most likely did not lead to security needs being met (Ein-Dor et al, 2010). Along this line of thinking, *Social-Defense Theory*, (Ein-dor & Hirschberger, 2016), suggests that there is likely an evolutionary advantage for humanity to have a variety of attachment strategies because it increases the chances of group survival.

The attachment behavioural system exists to deal with acute threats, but over time the residuals of these experiences build in complexity into what Bowlby (1969/1982, 1973, 1980) named *internal working models*. Our internal working models not only affect what we appraise as threatening but also guide cognitive, emotional and behavioural processes surrounding attachment system activation (Carr, 2012a; Mikulincer & Shaver, 2016).

Internal Working Models

Attachment relationships or attachment bonds have crucial implications for how individuals come understand and perceive themselves (e.g., ‘the self’, ‘self-in-relation to others’, ‘self in relation to the world’) through what Bowlby (1969/1982,1973, 1980) called *internal working models*. Internal working models are the assimilation of continuous and recurrent attachment interactions (Bowlby, 1973) that become internalized schematic mental representations and foster expectations or scripts based on those past experiences. From an evolutionary stance, it has been suggested that internal working models evolved out of an advantageous means of survival, helping humans to

quickly filter and generate expectations about scenarios, and allowing precious time and energy to be saved (Carr, 2012a; Ein-Dor et al., 2010). From a social-psychological standpoint, internal working models are similar to the concept of social schemas, cognitive scripts or 'hot' cognitions because they are residues of past emotions and memories that are triggered by similar experiences (Mikulincer & Shaver, 2016). In the same way, Bowlby (1973) conceptualized internal working models as cognitive-affective structures that trigger appraisals and evoke emotions and memories of previous interactions with attachment figures that in turn reflect notions about the self and others. Internal working models encompass unconscious rules for behaviour and emotional regulation in close relationships as well as influence expectations regarding the quality and availability of support from others, and, perhaps most importantly, whether support and protection is deserved (Carr, 2012a; Mikulincer & Shaver, 2016). Internal working models reflect grand relational concepts such as trust, worthiness, and deservedness to give and receive love (Carr, 2012a). They can be specific to a certain relationship (e.g., current romantic partner), a relational domain (e.g., friends, parents, romantic) or function at the global level (e.g., trust in people, positive belief in the social world; Carr, 2012a; Fraley, Heffernan, Vicary & Brumbaugh, 2011; Fraley, Hudson, Heffernan & Segal, 2015).

Internal working models represent the essence of how attachment figures *typically* responded to the attached person's signals of attachment system activation. Thus, attachment theorists (Bowlby, 1969/1982, 1973, 1980; Carr, 2012a; Mikulincer, 1995; Mikulincer & Shaver, 2016) believe that internal working models of the self, others and the world are developed and maintained through attachment interactions across the life span. As an individual matures into adulthood, these mental representations increase in

complexity rather than replacing previous information. This is in part why Bowlby (1969, 1973) believed that personality development (in combination with genetic influences) is continuously affected by our attachments and evolving internal working model, and thus, impact our experiences throughout life (Carr, 2012a; Mikulincer & Shaver, 2016).

Attachment researcher Sam Carr (2012a) nicely describes how attachment formation in childhood affects our ‘self’ and ‘other’ internal working models, stating that, “components of our self-concept and self-perception are linked to the internal working models that begin to unfold as a consequence of caregiver responsiveness to expressions of attachment needs” (p.13).

If an individual has an overall experience that their signals for proximity are *consistently* responded to by attachment figures, which subsequently leads to deactivation of the attachment system, the attached person integrates those experiences and expectations of support and availability into their internal working model. On the other hand, if over time it is the individuals’ experience that attachment figures are *regularly* unreliable in providing support or demonstrate *inconsistent* or responsiveness to their signals for proximity, then their internal working model will incorporate and generate those expectations into their existing working models of self and others (Bowlby, 1969/1982, Carr, 2012a; Fonagy & Targat, 2002; Fraley et al., 2015; Mikulincer & Shaver, 2016). Despite caregivers’ attempts to satisfy the needs of the child, it is ultimately the child’s perceived reality of attachment figures responsiveness and quality of support that builds and guides their internal working model. Other influential factors such as the child’s temperament or the attachment figures’ mental health can also influence the development of internal working models and attachment functioning because both can interfere with the caregivers’ ability to respond to attachment needs

(Bowlby, 1973; 1988; Carr, 2012a; Hesse & Main, 1999; Main, 2000; Mikulincer & Shaver, 2016). But even though childhood relationships are considered crucial in the development of internal working models and training the workings of attachment processes due to their primacy, (Bowlby, 1969/1982, 1973, 1988; Fonagy & Target, 2002), Bowlby (1969/1982, 1973, 1980, 1988) strongly asserted that internal working models are dynamic, continuously reconstructing and assimilating new ideas and experiences into existing models (Carr, 2012a; Mikulincer & Shaver, 2016). Hence the terminology: internal *working* model (Bowlby, 1969/1982; Carr, 2012a).

Individual Differences in Attachment

Secure and insecure attachment. Although the majority of children are born with a regularly functioning attachment system, one that pursues proximity to caregivers and attachment figures in times of distress or threat, the attainment of felt security is highly dependent on attachment figures' responsiveness (Bowlby, 1969/1982, 1973; Mikulincer & Shaver, 2016). As Cassidy (1999) explains, "whereas nearly all children become attached (even to mothers who abuse them Bowlby, 1956), not all children are securely attached"(p.7). Attachment theory suggests that recurrent transactions between attachment figures and the attached person often leads to the attachment behavioural system *not* deactivating during stressful times, and can consequently facilitate the frequent use of secondary attachment strategies (Bowlby, 1973; Ein-Dor et al., 2010; Mikulincer & Shaver, 2016). If felt security was not consistently gained using the primary proximity-seeking strategy, secondary strategies (hyperactivation and deactivation) can often replace the primary strategy in order to deal with the lack of attachment system deactivation during times of stress (Bowlby, 1973; Ein-Dor et al., 2010; Mikulincer & Shaver, 2016). In general, individuals who use the primary strategy

of the attachment behavioural system (proximity seeking) are classified as *secure* with respect to attachment and have a secure internal working model. People who have learned to use secondary strategies are classified as *insecure* with respect to attachment and have developed an insecure internal working model. Those who are insecurely attached and have learned to use hyperactivating strategies are broadly referred to in the literature as *anxious*, whereas those who have adapted to using deactivating strategies are broadly referred to as *avoidant* (Ein-Dor et al., 2010; 2012; Hudson et al., 2015; Main, 2000; Mikulincer & Shaver, 2016). The following section briefly explains the individual differences between an anxious and an avoidant insecure attachment patterns and how they develop and are maintained as a result of secondary attachment strategies (hyperactivation and deactivation strategies).

Anxious Attachment and Hyperactivating Strategies

Key distinguishing features of a more anxious attachment style is the use of hyperactivating strategies, which are exaggerations of the primary attachment strategy (e.g., intense monitoring of a relationship partner and strong efforts to maintain proximity). According to Mikulincer & Shaver (2016), people who are anxiously attached and use hyperactivating strategies will over depend on relationship partners for comfort, portray excessive demands for attention and caregiving, have strong desires for enmeshment with relationship partners, strive to minimize cognitive, emotional and physical distance and use clinging or controlling behaviours designed to guarantee a partners affection and support. Unfortunately, while sometimes successful depending on the relationship partner (e.g., parent, romantic etc.), ‘choosing’ (consciously or unconsciously) these over zealous tactics to gain support begin to seem both “natural and necessary, and they can become a cause for further relationship conflicts and emotional

distress” (Mikulincer & Shaver, 2016, p. 20) even leading to rejection or abandonment, which sadly and ironically “the very outcomes most dreaded by attachment-anxious people” (Mikulincer & Shaver 2016, p. 38). As Mikulincer and Shaver (2016) concisely explain...

Hyperactivating strategies and associated mental processes have negative effects on social perception; they damage an anxious person’s self-image by emphasizing helplessness and vulnerability to rejection and encourage negative appraisals of others (who are seen as untrustworthy, unfaithful, or frustrating). Chronic reliance on hyperactivating strategies places anxious individuals at risk for emotional and adjustment problems. It impairs their ability to regulate negative emotions, thereby perpetuating distress, which tends to continue even after objective threats subside. Hyperactivating strategies also have a negative impact on relationship satisfaction and stability, and they interfere with other behaviour systems by impeding their activation and diverting them to serve the goals of the attachment system (e.g., helping someone in order to be thanked, having sex with someone in order to deter or postpone rejection or abandonment). They maneuvers make it unlikely that an anxious person will attain the kind of security and equanimity necessary for good health, a clear mind, autonomous creativity and self-development (p. 38-39).

Avoidant Attachment and Deactivating Strategies

Attachment-avoidant people have come to adopt deactivating strategies, which inhibit the primary attachment strategy (i.e., proximity seeking), and have learned to perceive proximity seeking as “dangerous or disallowed” (Mikulincer & Shaver, 2016, p. 39) leading to “a denial of attachment needs and “compulsive self-reliance” (Bowlby, 1969/1982; Mikulincer & Shaver, 2016, p. 39). Avoidantly attached people dismiss threats and any need for attachment figures’ to be available for them, because thoughts of threat or attachment figures “may reactivate a defensively deactivated attachment system” (Mikulincer & Shaver, 2016). Mikulincer and Shaver’s (2016) describe the effects of avoidant peoples’ use of deactivating strategies in the following quote...

Deactivating strategies and their associated mental processes have a distorting effect on self-perception and destructive effects on the perception of others. Avoidant people defensively inflate their self-conceptions, presumably to feel less

vulnerable and less interested in relying on deficient relationship partners. They tend to denigrate partners, dismiss or downplay their needs and distrust them. Deactivating strategies also impair a person's ability to regulate negative emotions, causing avoidant individuals to keep anger and resentment alive internally while attempting not to express them externally. They are also prone to withhold commitment to even close relationship partners because they might make them dependent or vulnerable to rejection. And they tend to view their relationships as unsatisfying, giving themselves an excuse to flee if a relationship becomes too intimate or demanding. An avoidant person's pervasive downregulation of feelings and reluctance to express or experience enthusiasm interferes with other behavioural systems by making sure they (e.g., the caregiving system or the sexual system) do not result in increased intimacy or emotional involvement. (p. 39-40)

From these vivid descriptions, the connection and interplay between an individual's attachment history and current relationship functioning unfolds in cognitive, emotional and behavioural reactions to perceived threats and stress, even beyond a particular attachment relationship.

Measuring Attachment Characteristics

The strange situation procedure. The first study to measure individual differences in attachment was Mary Ainsworth and her students' (Ainsworth et al, 1978) *Strange Situation* procedure. This procedure was a way to assess the current developmental state of toddlers' internal working models with respect to attachment with their mother. The strange situation procedure simulates a realistic scenario that aims to activate the attachment behavioural system through presenting 'natural clues to danger' (Bowlby, 1973), allowing the child's behaviour under these conditions to be observed and coded (Main, 2000). In this procedure, the child is brought to an unfamiliar room, at first, only with their primary caregiver present, and then, a stranger enters the room. The attachment figure eventually leaves the room, and the child is left with the stranger for a short period until their caregiver returns. Facilitators monitor the change *or* lack of change in the child's behaviours under 'threat' (i.e., the absence of attachment figure, an

unknown place, an unknown figure). In short, they take note of the child's reaction to their attachment figure leaving the room, how they act during their absence, how they interact with the stranger in the presence and absence of their attachment figure, how they interact with their attachment figure once they return, as well as how and if the child explores the new and unfamiliar environment throughout the procedure (e.g. plays with toys or moves around the room).

What Ainsworth et al. (1978) and her colleagues discovered was that the stages of separation previously noted by Bowlby and Robertson (see Bowlby, 1973) in response to major separations from attachment figures in older toddlers, also appeared in the behaviours of some of the 'non-separated' twelve-month old toddlers during the strange situation procedure (Main, 2000). From this, three classifications or differences in *attachment style* were identified: *secure*, *anxious-ambivalent* and *avoidant* (Ainsworth et al., 1978; Main, 2000). These *attachment styles* were believed to reflect the current state of a child's internal working model of attachment to their mother (Main, 2000). The majority of toddlers responded flexibly under these conditions (e.g. playing with toys, interacting with the stranger, being soothed and calmed by the caregiver upon their return) and were thus classified as having a secure attachment. However, the other toddlers behaved strikingly similar to the children at different 'stages of separation' documented by Bowlby and his colleagues (Main, 2000).

Of those children, one subgroup were completely preoccupied with their mother throughout the entire procedure, yet they were not comforted by her presence upon return, despite calling out for her while she was gone (Main, 2000). Overall, this group of children, who seemed too distressed to explore the new environment, even when their mother was present, were classified as *anxious-ambivalent*. This pattern of behaviour was

similar to the state of protest observed by Bowlby and colleagues (Main, 2000). The other subgroup of children acted more like the children in the later stage of separation outlined by Bowlby and colleagues, detachment (Main, 2000). This group of children, classified as *avoidant*, showed very little or no distress when they were left alone in the unfamiliar environment and also ignored and/or avoided their mother upon return (Main, 2000). It seemed as though the presence of child's mother made little difference throughout the procedure.

According to attachment theory, when caregivers or attachment figures are *consistently* responsive and attentive to their child's signals for attention, support and comfort, especially in childhood, they will develop a secure attachment style and a secure internal working model (Carr, 2012a; Main, 2000; Mikulincer & Shaver, 2016). However, if a caregiver is *inconsistent* in their responsiveness or affection, the child is likely to develop an anxious attachment style, since, over time it has been their experience that attachment figure availability (in response to their signals for support and protection) is uncertain and unpredictable. This leads children with an anxious attachment style to lack confidence in their attachment figures' behavioural patterns when they are in need (Carr, 2012a; Main, 2000; Mikulincer & Shaver, 2016). Alternatively, if attachment figures in childhood were *consistently* neglecting, uninterested, often rejecting, or unable to read the signals their child's needs for comfort and affection, the child is likely develop an avoidant attachment style (Carr, 2012a; Main, 2000; Mikulincer & Shaver, 2016). The avoidant child has experienced attachment figure unavailability or neglect, and therefore, do not sense them as a source of felt security. In a way, children who are avoidantly attached have begun to disengage their emotional dependence on a repeatedly undependable source. The insecure-anxious and insecure-avoidant attachment styles are

both characterized by a lack of attentional flexibility in the strange situation procedure (Main, 2000).

Fascinated by the similarities between the stages of separation and attachment style, Ainsworth and her colleagues set out to investigate data she had previously collected on caregiving patterns of mothers from in Baltimore, Maryland, and Kampala, Uganda (Main, 2000). Through a blind investigation of Ainsworth's detailed narratives of mothers in the home, astonishingly, three patterns of caregiving were found to align with the three major patterns of child behaviours (i.e., attachment styles) observed in the strange situation procedure (Main, 2000). Further research regarding the connection between caregiving patterns and children's attachment style led George, Kaplan and Main (1985) to develop the *Adult Attachment Interview (AAI)*; a clinical interview assessing an adult's attachment state of mind by tapping into their childhood attachments and unconscious processes for regulating emotion. Assessing parents' attachment state of mind as assessed with the AAI has shown moderate reliability in predicting whether their child will present as avoidant, anxious or securely attached on the strange situation procedure (Ainsworth et al., 1978; George et al., 1985; Hesse & Main, 1999; Main, 2000; Mikulincer & Shaver, 2016).

Adult attachment interview. The Adult Attachment Interview (AAI; George, Kaplan & Main, 1985) is a semi structured clinical interview that assesses *attachment state of mind* in adulthood. The analysis and classification of attachment state of mind is calculated exclusively through verbatim transcripts of the recorded interview (Main, 2000). Similar to the assessment of attachment style on the strange situation procedure, the interview aims to access unconscious internal working models and classify attachment security or insecurity based on behavioural patterns evidenced during the

protocol (Main, 2000). By “surprising the unconscious” (Main, 2000, p.1077), the AAI is said to assess adults’ attachment state of mind with respect to their current representations of parents’ parenting and caregiving behaviours recalled from childhood (Carr, 2012; Main, 2000). A classification on the AAI is hypothesised to reflect specific forms of affect-regulation that can be observed and coded (by trained, experienced coders) from the discussion of attachment experiences (Carr, 2012a). The procedure does not code *what* is said per se, but rather *how* it is said.

The AAI protocol involves fifteen questions (Main, 2000) that are aimed at prompting narratives that are reflective of the individuals’ *current* attachment state of mind, in order to code transcripts for evidence of anger, coherence of discourse, and idealization (Carr, 2012a). The interviewer first asks respondents to describe their relationship with each parent in general. Following this, interviewees are asked to give five adjectives or phrases that describe their childhood relationship with each parent. Participants are then asked to give examples from their childhood that would support the adjectives they chose (Main, 2000). The interviewer then poses a series of questions that repeatedly asks the interviewee to “evaluate the effects of the experiences upon their current functioning” (Main, 2000, p.1078).

The assessment of attachment style in childhood using the strange situation procedure, compared to measuring attachment state of mind in adulthood using the AAI, differs because while an infants can be considered secure or insecure with respect to the person whom they are being observed with during the strange situation procedure, delineating security or insecurity in adulthood using the AAI, is not identified with any particular attachment relationship (Main, 2000). This distinction touches on some of the complexities involved with measuring attachment characteristics. For example, an

individual can be considered securely attached to their father but avoidant with their mother, or, they could be securely attached with respect to a current romantic relationship but have an insecure state of mind more generally as a result of their attachment history (Main, 2000). In general, the relationship between the childhood attachment behaviours and attachment characteristics in adulthood is, overall, equivocal (Ein-Dor, 2010; Hazan & Shaver, 1987; Fonagy & Target, 2002). These inconsistencies, however, have been suggested to mainly reflect differences in measurement (Mikulincer & Shaver, 2016).

During the AAI, adults with a secure attachment state of mind, called as *secure-autonomous*, demonstrate a clear valuing of attachment figures and attachment-related experiences in addition to an apparent objectivity in their description and evaluation of particular relationships (Main, 2000). They are able to identify adjectives and recall memories that are fluent with the adjectives they offer, providing evidentiary support for the adjectives they stated, regardless whether the adjectives or experiences are good or not. Main (2000) also stated that compared to other classifications using the AAI, individuals in the secure-autonomous classification often use fresh or original speech that seemed unlikely to have been spoken before (Main, 2000). They also demonstrate a tolerance for the “ultimate impossibility of distinguishing appearance from reality” (Main, 2000, p.1080) by acknowledging that their perspective may differ from their siblings and that their feelings may change from day to day.

Alternatively, insecure-avoidant adults, classified as having a *dismissing* state of mind (because they seem dismissing of the effects of attachment-related experiences), usually give largely positive descriptions of parents and have trouble remembering specific experiences from their childhood that support the positive adjectives they report (Main, 2000). Adults classified in the dismissing category quite often reply to the

interviewers questions with “I don’t remember”, and consequently, these interview are often shorter than adults in the other AAI classifications (Main, 2000). Notably, the behaviour of adults classified as dismissing on the AAI resembles the behaviour of children classified as avoidant in the strange situation procedure, as both avoid anger and distress (Main, 2000).

Insecure-anxious adults are classified as having a *preoccupied state of mind* on the AAI, because overall, they appear so remarkably preoccupied with a present relationship’s (or early relationships’) functioning that they are unable to describe and evaluate them with focus (Main, 2000). Adults classified as preoccupied with respect to attachment also seem to be “actively and angrily preoccupied with parental faults” (Main, 2000, p. 1080). Adults in this classification at times would use language that impelled the interviewer to agree with their descriptions and experiences (e.g., ...you know what I mean?”), as well as engaging in long vague descriptions, wandering off topic and would sometimes demonstrate subtle self/other confusions.

The last category is called *disorganized/unclassifiable or unresolved*, and is reflective of transcripts that do not fit in any of the three aforementioned *organized* classifications. Adults who fit in this classification, tend to switch from dismissing to preoccupied patterns of behaviour and are therefore considered disorganized with respect to attachment (Hesse & Main, 1999; Main, 2000; Mikulincer & Shaver, 2016). This classification is most commonly found in samples that are psychiatrically distressed, but sometimes individuals from low risk samples also respond in this fashion when asked about their attachment relationships (Main, 2000). This pattern, displaying both dismissing characteristics and preoccupied characteristics suggests the use of both hyperactivation and deactivation strategies to regulate emotions, is also called a *fearful*

attachment style (Mikulincer & Shaver, 2016). Insecure and disorganized attachment classifications are often associated with various forms psychopathology including anxiety and depression (Ein-dor et al., 2010; Mikulincer & Shaver, 2016).

Self-report measures. Observing self-regulatory mechanisms as evidence of individual differences in attachment is often easier in children than it is in adults, since, adult's awareness of these processes are often automatic, outside conscious awareness or blocked by defensive cognitions (Main, 2000; Mikulincer et al., 2002; Mikulincer & Shaver, 2016). The AAI has been called the 'gold standard' for assessing attachment as it is believed to tap into attachment related unconscious processes and internal working models (Carr, 2012a), but using this tool is time consuming and requires somewhat extensive training (Forrest, 2008; Carr, 2012a; Main, 2000; Mikulincer & Shaver, 2016). Beyond the AAI (and other projective instruments used to measure attachment style and attachment state of mind), social psychological researchers have attempted to measure attachment patterns using self-report measures. Mikulincer and Shaver (2016) believe self-report measures of attachment are just as valuable as interview or projective tests, and when used effectively, can also tap into unconscious mental processes related to attachment system functioning. Although behavioural (e.g., AAI) and self-report methods may assess different attachment related characteristics and can, depending on the measures used, mean different things (Carr, 2012a; Mikulincer & Shaver, 2016), they all still make a valid contribution to the attachment literature since both methods reflect the central components of attachment theory and are associated with a large body of empirical findings (Carr, 2012a; Ein-Dor et al., 2010; Mikulincer & Shaver, 2016). Even though categorical self-report measures exist (e.g., Relationship Style Questionnaire (RSQ; Griffen & Bartholomew, 1994), dimensional self-report measures will be the topic

of the following section since they are used more commonly in social psychological research.

Dimensional measures of attachment: avoidance and anxiety. It is generally accepted that the attachment categories outlined above can all be conceptualized across a two-dimensional space: *anxiety* and *avoidance* (Ein-Dor et al., 2010; Fraley et al., 2015; Mikulincer & Shaver, 2016). In support of this, Fraley et al. (2015) found that attachment patterns might be better explained by dimensional models compared categorical ones, suggesting that individuals maintain a sort of prototype across different relationships. Dimensional self-report measures of attachment assess the extent to which individuals rate their association with behaviours and thoughts related to hyperactivation and deactivation strategies regarding attachment relationships (Ein-Dor et al., 2010; Mikulincer & Shaver, 2003).

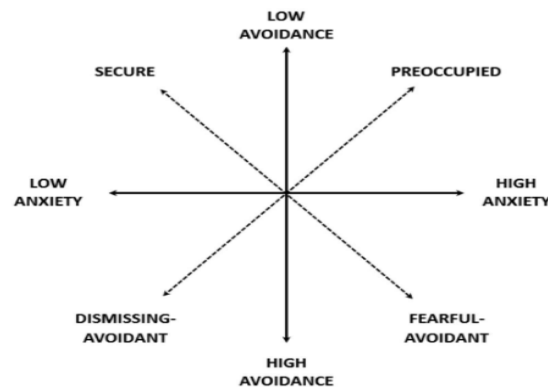


Figure 1. The two-dimensional model of attachment (Bartholomew, 1990)

The attachment-related avoidance dimension “reflects the extent to which a person distrusts relationship partners’ goodwill, strives to maintain independence, and relies on deactivating strategies for dealing with dangers and threats” (Ein-Dor et al., 2010, p. 125; Mikulincer & Shaver, 2003). The attachment-related anxiety dimension,

“reflects the extent to which a person worries that a relationship partner will not be available in times of need and hyperactivates the attachment system in an attempt to gain the partner’s attention, care, and love (Ein-Dor et al., 2010, p. 125; Mikulincer & Shaver, 2003). Being high on the anxiety dimension and low on the avoidance dimension would associate with an insecure-preoccupied classification on the AAI or a more anxious attachment style. The opposite, being low on anxiety but high on the avoidance dimension, would associate with a insecure-dismissive classification on the AAI or a more avoidant attachment style. Low representations on both dimensions, are indicative of attachment security, which is commonly associated with increased perceptions of self-efficacy, positive affect and problem focused coping strategies for dealing with personal and interpersonal stressors (Ein-Dor, et al., 2010), whereas high on both anxiety and avoidance indicate more disorganized attachment insecurity patterns (e.g., fearful-avoidant attachment, see Figure 1).

Self-Regulation, Appraisals of Threat, and Coping

Attachment theory has become one of the most influential frameworks for understanding emotional regulation (Mikulincer & Shaver, 2016). Essentially, a central function of the attachment behavioural system *is* to regulate emotion by way of seeking and maintaining proximity with attachment figures (Mikulincer et al., 2002; Mikulincer & Shaver, 2016). As outlined above, hyperactivating strategies and deactivating strategies become attuned with confrontations with stress and eventually internal working models on both specific and global scales over time (Hudson et al., 2015; Mikulincer & Shaver, 2016). If emotion regulation through proximity seeking is the goal of the attachment system, secondary strategies can be understood as ‘goal corrected’ ways of regulating the

emotional response that persists from a lack of felt security when attachment needs are not met through the primary strategy (Mikulincer & Shaver, 2016).

Bowlby (1969/1982, 1973, 1980) and other researchers interested in attachment (e.g., Carr, 2012a; Fonagy & Target, 2002; Mikulincer & Shaver, 2016) believe attachment relationships formed in childhood are particularly critical because they develop during a sensitive phase of cognitive, affective and physical development, where internal factors related to memory, attention, self-regulation, and motor movement are all simultaneously developing within the context of emotional attachment bonds. Within this critical period (between 0-3 years) infants and toddlers are at the mercy of caregivers attending to and resolving their distress, since they cannot as yet communicate efficiently through language, and do not have the motor abilities or the cognitive capacity to aid in self-regulating their own emotions (Carr, 2012a; Fonagy & Target, 2002). Once again, this highlights the importance of the attachment figures' sensitivity, responsiveness and ability to calm and deactivate the child's attachment system during times of stress or threat in early childhood (Fonagy & Target, 2002).

Fonagy and Target (2002) explain the development of emotional regulation in childhood in their paper entitled *Early Intervention and the Development of Self-regulation*. They propose that the attachment figure is a trainer for the attached child to develop an interpretive and emotional capacity to self-regulate their emotions under stress (Fonagy & Target, 2002). The authors suggest that, even beyond Bowlby's rationale that the caregiver-child relationship creates a certain prototype for future attachment relationships through self and other internal working models, a child's early experiences profoundly effect the development of what they call an *Interpersonal Interpretive Mechanism* (IIM). The IIM "evaluates the social environment and moderates the

expression of the genotype” (Fonagy & Target, 2002, p. 307) and influences an individuals’ capacity to “regulate their reaction to stress, their capacity to maintain focused attention and their capacity to interpret mental states in themselves and others” (Fonagy & Target, 2002, p. 308). Thus, attachment experiences impact out capacity for confrontations with stress, appraisals of past, present and future stressors, and expectations and beliefs about relationships.

Additionally, Mikulincer and Shaver (2016) have explained how emotional regulation is developed and sustained through threat appraisals, and the associated emotional and physical response of attachment figure availability in the following description of their (2003) model of attachment-system functioning and dynamics in adulthood...

In the model, emotions, considered to be biologically functional, organized systems of evaluative thoughts and action tendencies supported by physiological changes, are generated by the appraisal of internal and external events in relation to goals and concerns. The emotions that arise in conjunction with appraisals are experienced and expressed through changes in thoughts, available memories, action tendencies, behaviours, and subjective feelings. The subjectively experienced aspects of emotions are obviously associated with physiological changes, some of which have perceptible consequences (e.g. speeded heart rate, blushing, gasping for air). Both the generation and the expression of emotions are affected by regulatory efforts, which can alter, obstruct, or suppress appraisals, concerns, action tendencies, and subjective feelings. (p. 189)

It can be seen through this description how emotions and appraisals of distress resulting from attachment figure availability or unavailability collectively become experienced cognitively and viscerally. The repetitive processes of appraisal, emotional response to threats and proximity to attachment figures eventually, in part, become automatic and unconscious (Mikulincer & Shaver, 2016). Mikulincer and Shaver’s (2003) model of attachment in adulthood nicely outlines the dynamics and functioning of the attachment behavioural system. The following passage displays their view on the security enhancing,

emotionally stabilizing and attentional affects that occur when proximity-seeking leads to felt security with an attachment figure over time;

Mental representations of the self come to include incorporated or introjected traits of security providing attachment figures, so that self-soothing and soothing by actual others become alternative means of regulating distress. For example, a student undergoing a difficult examination can call to mind the beneficial support provided on previous occasions by security-providing attachment figures, and can regulate anxiety and focus attention partly by calming herself in some of the same ways her attachment figure previously calmed her. (Mikulincer & Shaver, 2007, p. 14)

Overall, attachment theory (Bowlby (1969/1982, 1973, 1980, 1988) posits that attachment *security* will increase the likelihood that individuals can cope with bouts of negative emotions, regain optimism and maintain equanimity, while on the other hand, attachment *insecurity* interferes with emotional stability and regulation, increasing the likelihood of experiencing social maladjustment and mental health issues (Mikulincer & Shaver, 2016).

Mikulincer and Shaver's (2003) model of attachment-system functioning and dynamics addresses attachment processes and the development of attachment characteristics by looking at the possible trajectories of attachment system activation and deactivation at 3 stages; (1) proximity seeking (conscious/unconscious) during distress or threat (which is, as explained, the primary attachment behavioural strategy for dealing with threats), (2) whether individuals' perceived benefit of using this strategy to attain support of attachment figures is sufficient, (3) the pursuance of alternative or secondary strategies as a result of attachment figure unavailability or unresponsiveness (Mikulincer & Shaver, 2016). According to this model, "a person's perception of internal or external events as threatening is the critical trigger for attachment system activation" (Mikulincer & Shaver, 2007, p. 12). Following the appraisal of a stimulus, proximity seeking or secondary strategies are consciously or unconsciously used as a means of regaining a

sense of felt security. For people who adaptively learned to use secondary strategies because felt secure was not easily attained or available (i.e., insecurely attached), appraisals of situations involving attachment threat or security threats can be biased, and the resulting inhibitory or excitatory circuits initiated during these appraisals can lead to individual differences in emotional, cognitive and behavioural responses (Carr, 2012a; Mikulincer & Shaver, 2016). A large body of research supports that attachment security, in comparison to anxious or avoidant patterns, is associated with lower psychological distress, (e.g., greater self-confidence and self-esteem) adaptive functioning and helpful coping behaviours (e.g., problem focused versus emotion or distancing) especially when stressful life events (e.g., college transition, interpersonal conflicts, trauma) are encountered (e.g., Lopez & Gormley, 2002; Mikulincer & Florian, 1995; Mikulincer, Florian & Weller, 1993; Mikulincer & Shaver, 2016).

Attachment, Threat, Attention and Performance

Under stressful or threatening conditions, differences in attentional tendencies have been found to exist between secure, anxious or avoidant individuals (Carr, 2012a; Dweitte, Koster, De Houwer, & Buysse, 2007; Larose, Bernier & Tarabulsky, 2005; Lopez & Gormley, 2002; Mikulincer et al, 2002; Mikulincer & Shaver, 2016; Simmons, Gooty, Nelson & Little, 2009; Van Emmichoven et al., 2003). For example, Larose, Bernier and Tarabulsky (2005) looked at how differences in attachment state of mind affect learning dispositions and academic performance during students' transition to college. They found from the last semester of high school and across three college semesters, secure-autonomous students demonstrated better learning dispositions (including attention) compared to students classified as preoccupied (i.e., high anxious orientation) or dismissive (i.e., higher avoidance orientation). Additionally, it was found that the

dismissing students received the lowest grade average in college compared to their preoccupied and secure counterparts and that this association was mediated by the reported quality of their attention (Larose et al., 2005). Other research on attachment and attention has shown avoidant attachment to be associated with superior attentional focus and executive control while performing attention *tasks* (e.g., Gillath, Geisbrecht & Shaver, 2009) but that this cognitive control often breaks down under high or prolonged cognitive or emotional loads (Mikulincer et al., 2004).

To date, it seems that people who are more avoidant with respect to attachment may have a particular vulnerability to attachment related threats (e.g., reminders of a separation), whereas people who are more anxiously attached can often become emotionally reactive in neutral contexts *as well* as stressful and threatening conditions, attachment related or not (Mikulincer et al., 2002; Dewitte et al, 2007; Mikulincer & Shaver, 2016). But some research has found that *both* avoidant and anxious individuals (children and adults alike) ignore or visually avoid representations of attachment related threats and are less inclined to process and recall threatening information compared to secure individuals (Carr, 2012a; Dewitte et al., 2007; Van Emmichoven et al., 2003). In some ways, these results conflict with the predictions of attachment theory because insecure-anxious individuals who use hyperactivation strategies and are hypervigilant in the face of perceived threats, might be expected to focus their attention *toward* threatening stimuli. Despite the theoretical differences between anxious and avoidant attachment patterns, this “general dismissing style of attention” (Carr, 2012a, p.78) that is often observed with insecure attachment patterns may serve in assisting insecure individuals’ self-regulatory efforts that are ‘compromised’ or reduced from the use of

secondary attachment strategies during attachment behavioural system activation (i.e. when threats are perceived) (Dewitte et al., 2007).

Attachment in Sport

Attachment theory has been applied to sport and exercise domains (e.g., Carr, 2009a, 2009b; 2012a, 2012b; Dizdari et al., 2013; Dumas, Turrisi & Wright, 2006; Ein-Dor et al., 2012; Felton & Jowett, 2013, 2015; Davis & Jowett, 2010; Forest, 2008; Li, Bunke & Psouni, 2016; Sukys, Linsinskiene & Tilindiene, 2015; Tiryaki & Cepikkurt, 2007). Individual differences in attachment have been found to affect the quality of sport experiences as well as factors likely to influence sport performance (Carr, 2012b; Dizdari et al., 2013; Felton & Jowett, 2017; Forrest, 2008; Ein-Dor et al., 2012). In his book entitled *Attachment in Sport Exercise, and Wellness*, Sam Carr (2012a) discussed the theoretical implications and applicability of attachment theory in the sport domain as well as reviews current research on attachment theory in sport. For example, Carr (2009a; 2012a) outlined how attachment theory has many conceptual similarities and alignments with some of the major theories related to sport motivation and participation, such as self-determination theory (e.g., Felton & Jowett, 2013, 2015, 2017; La Guardia, Ryan, Couchman & Deci, 2000) and achievement goal theory (Elliot & Reis, 2003), all highly relying on individuals' environmental appraisals and coping. Carr (2012a) also outlined connections between attachment characteristics and dealing with pain and injury, suggesting that response to these frequent occurrences in sport might be experienced more intensely by athletes who are insecurely attached (Eisenberger, Lieberman & Williams, 2003; McWilliams & Asmundson, 2007; Meredith, Ownsworth & Strong, 2008; Meredith, Strong & Feeney, 2005, 2006; Mikulincer & Florian, 1998). Other research has provided support for a relationship between attachment characteristics and

team (and group) cohesion (Lavy, Bareli & Ein-Dor, 2015; Tiriyaki & Cepikkurt, 2007; Rom & Mikulincer, 2003; Mikulincer & Shaver, 2017). In line with social defense theory (Ein-Dor et al., 2010) mentioned earlier in this paper, that research suggests that a variety of attachment orientations or styles increase cohesion (Carr, 2012a; Ein-Dor et al., 2016).

Davis and Jowett (2013) developed the Coach Athlete Attachment Scale (CAAS) to assess beliefs of athletes and coaches regarding their relationship. Individual differences in coach and athletes' attachment styles have been found to affect the quality of the coach-athlete relationship and athlete's perceptions of well-being and satisfaction within the sport context (Davis & Jowett, 2013; Felton & Jowett, 2013, 2015). Additionally, individual differences in attachment with respect to parent and friend relationships have been found to influence adolescent's physical self-perception and level of physical activity (Li et al., 2016). Furthermore, Carr (2009b) discovered that parent-child attachments influenced the quality of sport friendship between adolescent teammates, suggesting that parental attachment relationships overflow and influence peer relationships in sport.

More recently, Dizdari, Bunke and Psouni, (2013) looked at attachment styles, self-confidence, competitive anxiety and performance in elite and sub-elite swimmers. Higher levels of attachment anxiety and avoidance were found to be associated with poorer self-confidence, higher competitive anxiety and poorer performance results, although performance results did not significantly differ (Dizdari et al., 2013). Interestingly, more athletes with a secure attachment style were found in the elite swimmers group, whereas athletes' with an insecure attachment (avoidant or anxious) were found among sub-elite swimmers (Dizdari et al., 2013). Lastly, research on attachment and performance in professional singles tennis by Ein-Dor, Reizer, Shaver and Dotan (2012) showed that

higher levels of avoidant attachment predicted higher performance rankings across 16 months. The authors suggested that the field of professional tennis (and others) might be well fit for and rewarding of personality characteristics such as self-reliance and independence, which are central to an avoidant attachment orientation.

Forrest (2008) has proposed that an “attachment-based self-regulatory perspective suggests that attachment states of mind may be underlying individual differences in attentional flexibility under competitive stress” (p. 242). In her paper entitled *Attachment and Attention in Sport*, Forrest (2008) suggested that attachment related differences, rooted in early attachment experiences, might be able to explain why some athletes are better able to “respond and regulate competitive stress and achieve performance optimizing states” (p.243). It may be that insecurely attached athletes are more vulnerable to experiencing performance deficits under competitive stress such as travel, fatigue, fear of failure and stress from sport relationships (Forrest, 2008). Differences in athletes’ attachment characteristics could partially explain why some athletes do not consistently translate their training performances to competition performances, or why some athletes are more prone to choking under pressure (Forrest, 2008). Considering the latter, Forrest (2008) points out how “attachment processes may have particular relevance for the choking-under-pressure phenomenon because this involves performance under increased stress or threat” (p. 250). This stance is also in line with Bowlby’s (1969/1982) position that the “attentional effects of attachment-related processes would be most readily observed during critical moments when stress or threat would be experienced most intensely” (p. 250). Performing under pressure in sport has not been experimentally tested using an attachment based self-regulatory perspective; a perspective suggesting that attachment related attentional differences could interfere with task execution under

pressure for athletes with a insecure state of mind (Forrest, 2008). It is unknown whether sport performance pressure may function as a threat trigger for athletes, potentially leading to attentional lapses that interrupt the processing of task relevant information for more so for insecurely attached athletes.

Chapter 2: Rationale, Purpose, and Hypotheses

Rationale

With roots in psychoanalysis, ethological and evolutionary ideas, attachment theory (Bowlby, 1969/1982, 1973, 1980) has generated a vast body of research and conceptual elaborations (e.g., Ein-Dor et al., 2016; Fonagy & Target, 2002; Mikulincer & Shaver, 2003; 2017) that have provided clinicians and researchers alike with a dynamic model to investigate relationship functioning, personality development, individual differences and mental health (e.g., Carr, 2012a; Fraley et al., 2015; Gillath, Sesko, Shaver & Chun, 2010; Mikulincer & Shaver, 2016). It has become one of the most highly developed scientific theories focusing on human emotion and behaviour (Mikulincer & Shaver, 2016). Researchers have recently begun to investigate the implications of attachment theory in sport (e.g., Carr; 2009a, 2009b, 2012a, 2012b; Davis & Jowett, 2010, 2013; Dizdari et al., 2013; Doumas et al., 2006; Ein-Dor et al., 2012; Felton & Jowett, 2013, 2015, 2017; Forrest, 2008; Li et al., 2016; Sukys, Linsinskiene & Tilindiene, 2015), recognizing that the developmental significance of relationships can influence how we respond psychologically in specific contexts. Competitive sport (especially at higher levels) is a context where even the most skilled and expert athletes must possess the capacity to cope with competitive stressors and perform consistently across time and situation. Athletes must be able to maintain a level of concentration, confidence and motivation in order to perform in crucial moments and persist through adversity (e.g., Beilock & Carr, 2001; Lazarus, 2000; Vickers & Williams, 2007; Wang et al., 2004). It is also a context where close relationships are prominent (e.g., Carr, 2012a, 2012b; Felton & Jowett, 2010).

It is unknown whether competitive stressors in sport (e.g., uncertainty of performance outcomes, high stakes/importance of game/match, threat to self or athletic identity, fear of failure or losing, fatigue, injury, etc.) are triggering situational factors (or in Bowlby's words natural clues of danger) for the attachment behavioural system. Furthermore, it is unknown whether, or what extent, individual differences in attachment (e.g., higher avoidance or anxiety orientation) could influence or moderate appraisals and responses to competition stressors and/or performance outcomes (Carr, 2012a; 2012b; Forrest, 2008). Attachment characteristics have previously been found to affect observable differences in behaviour during confrontations with stressful or threatening situations (Campbell, Simpson, Kashy & Rholes, 2001; Ein-Dor et al., 2010; see Mikulincer & Shaver, 2016 for a review). Attachment researchers, however, have only begun recently to investigate the influence of attachment characteristics in relation to sport performance. For example, researchers have investigated and revealed the effects of attachment relationships with coaches and parents on teammate relationships as well as well-being (e.g., Carr, 2009b; Davis & Jowett, 2010; Felton & Jowett, 2013, 2015, 2017). Less research has focused on sport performance, where only performance rankings have been utilized as performance outcomes with respect to individual differences in attachment (Dizdari et al., 2013; Ein-Dor et al., 2012). No research has directly investigated whether sport performance pressure acts as a trigger that activates the attachment behavioural system of competitive athletes, whether the attachment behavioural system is activated to a greater extent for insecurely attached athletes, or whether these trait-like differences impact sport performance (Forrest, 2008).

Navigating competitive stressors and performing under pressure are central elements of competitive sport. Many competitive sport scenarios that involve

performance under pressure may constitute what Bowlby (1973) referred to as a compound situation; scenarios that are likely to trigger attachment behavioural system activation. Fatigue, environmental unfamiliarity due to travel, new or unfamiliar venues, (e.g., away versus home games/matches), previous experiences with opponents or unfamiliarity of opponents, importance of competition, coach and teammate stressors, are only a few possible triggers that especially when combined, may activate the attachment behavioural system and influence cognitions and behaviour (Forrest, 2008). Furthermore, due to the attachment histories and internal working models of athletes who are insecurely attached, confronting a potential failure (e.g., fear of failure) or actually failing (losing, failing on a task etc.) in sport, may trigger previous memories of rejection or loss (Forrest, 2008), which, accompanied by negative affect, may consciously or unconsciously activate the attachment behavioural system simultaneously to varying degrees depending on the level of threat perceived.

Since sport performance does not occur in a vacuum, it is quite plausible that an athlete's attachment state of mind may be influencing their sport performance, especially under pressure (Carr, 2012b; Forrest, 2008). Potentially, competition stressors that are part of the central essence of sport competition, may interfere to a greater extent with the skilled performance of insecurely attached athletes under pressure, due to their reduced threshold for maintaining emotional stability as well as their developed attentional inflexibility under attachment-related and non-attachment related threat (Carr, 2012a; Forrest, 2008; Gillath et al., Main, 2002; Mikulincer & Shaver, 2016; Dewitte et al., 2007; Main, 2000).

Individual differences in attachment may also shed light on the phenomenon of choking under pressure (Forrest, 2008). In the past, choking in sport definitions were

accepted, such as “performing more poorly than expected given one’s skill level” (Beilock & Carr, 2001, p. 701), experiencing “performance decrements under pressure circumstances” (Baumeister, 1984, p. 610) or “the occurrence of inferior performance despite striving and incentives for superior performance” (Baumeister & Showers, 1986, p. 361). More recently however, researchers have begun to question whether ‘choking’ and ‘under performing’ are necessarily varying degrees of the same underlying processes in relation to performing under pressure, or whether these behaviours are distinct, and involve different cognitive processes altogether (Mesagno, Geukes & Larkin, 2015; Mesagno & Hill, 2013). This choking versus under-performance dichotomy has fuelled widespread debate in the field of sport psychology (e.g., Gucciardi & Dimmock, 2008; Hill, Hanton, Flemming & Matthews, 2010; Mesagno & Hill, 2013a; Mesagno et al., 2015). But beyond involving a magnitude of decline in performance, which is often cited as distinctness between choking and an under performance (Mesagno & Hill, 2013), other factors such as skill level (e.g., novice versus expert), the difficulty of the task, and the amount of anxiety experienced, also contribute the complexity of researching, defining and understanding the separateness or sameness of ‘choking’ and ‘under-performing’ under pressure in sport (Gucciardi & Dimmock, 2008; Hill et al., 2010; Mesagno & Hill, 2013; Mesagno et al., 2015). Although there is still no universally accepted definition of choking under pressure, and the choking-under performance debate continues, Mesagno and Hill (2013) have proposed a working definition of choking as “an acute and considerable decrease in skill execution and performance when self-expected standards are achievable, which is the result of perceived anxiety under increased pressure” (p.273).

Attachment may be an underlying trait-like personality correlate that contributes to an individual’s susceptibility of under performing (or even choking) in high pressure

situations (Forrest, 2008). Researchers have found that individual trait differences such as private and public self-consciousness (Geukes et al., 2013), fear of negative evaluation (Mesagno et al., 2012), narcissism (Wallace & Baumeister, 2002; Geukes et al., 2012, 2013) coping style (Wang et al., 2004a), and trait anxiety and self-confidence (Baumeister & Showers, 1986; Otten, 2009; Wang, Marchant, Morris & Gibbs, 2004) are linked to one's susceptibility of choking/under performing in sport (Mesagno et al., 2015). It may be that our attachment histories influenced the development and expression of personality traits that are involved in our reactions to performance pressure, which in turn affects our current attachment functioning and how athletes react to performance pressure in sport scenarios (Bowlby, 1969/1982, 1973, 1980; Carr, 2012; Forrest, 2008).

Various explanations of choking (e.g., distraction/attention/working memory, self-focus/explicit monitoring, embodied cognition) have attempted to explain what contributes to the processes involved in maintaining performance standards under pressure (e.g., Baumister, 1984; Beilock & Carr, 2001, Cappuccio, 2015; Eysneck, Derakshan, Santos & Calvo, 2007; Wilson & Vine, 2009; Tenenbaum, Basevitch, Gershgoren, Filho, 2013; Mesagno, Geukes, Larkin, 2015; Yin, 2015), but when and why under performances or choking happens to certain athletes more than others, still remains unclear (e.g., Forrest, 2008; Mesagno et al., 2015; Vickers & Williams, 2007; Vine, Lee, Moore & Wilson, 2013; Tenenbaum et al., 2013). The theoretical models of choking/performing under pressure complement the theoretical aspects of attachment theory and research on individual differences in attachment relating to self-regulation, attention, and threat appraisals (Forrest, 2008). For example, distraction theories (e.g., Beilock, 2008; Eysneck et al., 2007; Mattarella-Micke, Mateo, Kozar, Foster, Beilock, 2011; Wine, 1971) suggest that attention breaks down as a result of distraction from

external sources (e.g., pressure, interpretation of stress or threat) whereby cognitive resources (e.g., attention and working memory) are distributed and used for task unrelated processes, therefore interfering with skill execution. The explicit monitoring or self-focus models of choking (e.g., Baumister, 1984; Beilock & Carr, 2001; Geukes et al., 2013; Wulf, McConnel, Gartner & Shwartz, 2002) suggest that attention or awareness is internally (rather than externally) focused on physical movements that lead to non-automatic processing, hyper-vigilance or over appraisals of bodily responses, which interfere with performance. Individuals who are insecure-anxious with respect to attachment, and who implement hyperactivating strategies, may be expected to inflexibly attend inward and focus on the self, even under low amounts of pressure since they often appraise even neutral situations as threatening (Forrest, 2008; Mikulincer et al., 2002). Insecure-avoidant people may benefit from their deactivating strategies in terms of task relevant attention under low pressure, potentially dampening or denying the impacts of the threat, but perhaps not under high pressure, in other words high cognitive or emotional loads (Gillath et al., 2009; Mikulincer et al., 2004).

According to attachment literature, insecurely attached athletes may likely experience more attachment system activation and require more self-regulatory efforts in the face of competitive stress (Bowlby, 1969/1982, 1973; Carr, 2012a; Forrest, 2008; Gilbert, McEwan, Bellew, Mills & Gale, 2009) in part due to their use of secondary attachment strategies (i.e., hyperactivation and deactivation). Because of attachment histories involving rejection, loss and/or a lack of quality support during times of need, and the current status of their global internal working model (Hudson et al., 2015), athletes with a more anxious and/or avoidant orientation may potentially appraise environmental stressors and attachment-related stressors in sport contexts as threatening, or

at least, to a greater extent than securely attached athletes do (Forrest, 2008). Thus, compared to more securely attached athletes, when insecurely attached athletes are confronted with pressure to perform in sport, it may cause more cognitive resources commonly used for task execution to be allocated toward self-regulatory functions (hyperactivation and deactivation strategies) aimed at calming their alarmed attachment behavioural system (Forrest, 2008). On the other hand, the attachment behavioural system of a securely attached athlete may or may not activate under pressure, or may quickly deactivate in these stressing situations since their internal working model (e.g., mental representations and memories of attachment figures) easily leads to felt security and promotes exploration and appropriate risk taking (Bowlby, 1973; Mikulincer et al., 2002; Mikulincer & Shaver, 2016).

Researchers have found that attentional differences exist *between* those who are avoidant and anxious with respect to their attachment; where attachment avoidant individuals demonstrate superior attentional skills even beyond that of securely attached individuals (e.g., Gillath et al., 2009; Mikulincer et al., 2004). However, other researchers have found that *both* anxious and avoidant (i.e., insecurely attached) individuals avert their attention *away* from threatening stimuli (i.e., attachment related pictures, threat words, attachment-related threat words), potentially as a way of controlling their emotional response or mood (Dewitte et al., 2007; Main, 1985; Van Emmichoven et al., 2003). Secure individuals, on the other hand, seem to process threatening information more fully (e.g., did not look away from threats) and are able to recall threatening more accurately, which may be evidence that working memory is functioning well when threats are perceived (Van Emmichoven et al., 2003). Thus, insecurely attached athletes may be more likely to under-perform or choke more often under pressure because the attachment

behavioural systems recruiting of cognitive resources (i.e., initiation of hyperactivation and deactivation strategies) and trumping the allocation of mental resources, such as attention, that are normally allocated to task relevant information (sport performance task) which subsequently interferes with well learned automatic processes.

Additionally, certain relationships may have more of an influence on sport performance and experiences compared to others (Carr, 2009b, 2012b). The ongoing presence and development of certain types of relationships (e.g., with coaches, teammates, sport psychologists, athletic trainers, etc.) within the context of sport has inspired researchers to investigate the potential differential influence that 'sport specific relationships' could have on performance compared to other relationships, and to what extent they can be considered attachment relationships (e.g., characterized by proximity seeking, secure base or safe haven: Carr, 2009a; 2009b; 2012b; Davis & Jowett, 2010; 2013; Felton & Jowett, 2013; 2015; Tiryaki & Çepikkurt, 2007). But much more research is needed to understand whether domain specific sport relationships compared to other relationships (e.g., parents, romantic partners, friends) can impact team and individual sport performances, or whether the presence of a secure sport relationship or other attachment relationship (e.g., parent, romantic, best friend) can act as a buffer (Bowlby, 1988) against competitive stressors or have the ability to enhance sport performance for athletes (Carr, 2012a, 2012b).

A greater understanding of the implications that attachment has in sport could provide many benefits to researchers and practitioners alike. Such research may include whether performing under high pressure is influenced by athletes' attachment behavioural system, whether this differs by individuals' level of attachment security, and how sport specific relationships may impact attachment characteristics. For starters, these

implications could improve athletes' self-awareness of how they interpret and behave in relationships and how they typically respond to attachment related and non-attachment related stressors in sport domains (Carr, 2012b). Enhanced self-awareness could also improve how athletes prepare for competitions (i.e., who they spend time with prior to competition) or provide insight into their reactions to coaches and teammates behaviours during competition, for example. Furthermore, attachment security priming strategies (e.g. Gillath et al., 2009; Gillath, Sesko, Shaver, Chun, 2010; Rosenthal et al., 2012) could be included in pre-competition routines (e.g., coaches 'pep talks' to athletes or whole team) to prime athletes with a sense of relationship security with appropriate attachment figures (e.g., coach, teammate, parents). Attachment awareness could also help coaches designate appropriate roles (e.g., captains) or pairings (e.g., line matches, defensive pairings etc.) on a team, and help improve team cohesion (Ein-Dor et al, 2010; Lavy, Bareli & Ein-Dor, 2014; Rom & Mikulincer, 2003; Mikulincer & Shaver, 2017; Tiryaki & Cepikkurt, 2007).

With knowledge of attachment differences, athletes could also seek the support of a sport psychologist with respect to unresolved attachment related-issues that could be affecting their performance, sport satisfaction, motivation, wellness and mental health (e.g. interpersonal and relationship difficulties, generalized anxiety or depression) as well as provide relationship knowledge so that peer and romantic relationships may be chosen wisely (Carr, 2012a; 2012b; Levine & Heller, 2010). Overall, knowledge of attachment related-factors may help athletes, and people who work with athletes improve self-awareness, communication, performance, and well-being, as well as help to prevent sport burnout, withdrawal or poor mental health (Carr, 2012a; Mikulincer & Shaver, 2016; Rice, Purcell, De Silva, Mawren, McGorry & Parker, 2016). Information of how

attachment characteristics may affect athletes and performance could benefit the practices of coaches, trainers, and sport psychologists, and help to enhance performance success, and wellness (e.g., reducing burnout, improve mental health) for competitive athletes (Carr, 2012a; Felton & Jowett, 2013, 2015; 2017; Gilbert et al., 2009; Mikulincer & Shaver, 2016, 2017; Pines, 2004; Simmons et al., 2009).

Purpose

The purpose of this study was to expand the literature on attachment in sport, by examining the predictive value of attachment orientation on performance change under pressure on a sport motor task. Specifically, this study investigated whether athletes' self-reported attachment orientation to their mother, father and closest teammate, would be predictive of performance changes under different amounts pressure on a basketball free throwing task. This project addressed the following research questions:

1. Does an athlete's attachment orientation to a parental figure (i.e., mother and/or father) influence performance under pressure on a sport motor task?
2. Does an athlete's attachment orientation to their closest teammate influence performance under pressure on a sport motor task?

Hypotheses

1. Athletes' performance differential scores between low and high pressure performance conditions would be predicted by athletes' attachment anxiety and attachment avoidance scores. These predictions were examined for athletes' attachment orientation with their 1) mother/mother-like figure; 2) father/father-like figure; 3) closest teammate. Specifically, higher levels of attachment anxiety would predict the poorest performance under low pressure and a decline in performance from the low pressure to the high pressure condition (i.e., negative

performance differential scores), while higher levels of attachment avoidance would predict the highest performances under low pressure, and may predict *either* a performance decline or no performance change under high pressure (i.e., negative or no performance differential score).

These predictions are based on research evidence that attachment insecurity (i.e., greater levels of anxiety and/or avoidance) is often related to attentional biasing *away* from threats, while greater attachment security (low levels of attachment anxiety and avoidance) is associated with emotional stability, attentional flexibility under threat, and less defensive exclusion of negative material upon recall of attachment related experiences (Dewitte et al., 2007; Main 2000, Mikulincer et al., 2002; Mikulincer & Shaver, 2016; Van Emmichoven et al., 2003). Additionally, these predictions are based on Forrest's (2008) proposal that athletes with an insecure attachment state of mind would likely have a tendency toward emotional and attentional inflexibility under competitive stress, such as performance pressure. Specifically, due to their use of hyperactivation or deactivation strategies, insecurely attached athletes may have an increased susceptibility of performing poorly under sport performance pressure (Forrest, 2008).

Research has also shown that people who are more anxiously attached demonstrate a greater degree of sensitivity for appraising threats in the environment in both neutral and threatening conditions, as well as greater emotional reactivity due to the use of hyperactivating strategies (e.g., Ein-Dor et al., 2010; Mikulincer et al., 2002; Mikulincer & Shaver, 2016). Other research has demonstrated that under high cognitive or emotional loads, avoidantly attached individuals' defenses of using deactivating strategies often break down (Gillath et al., 2009a; Mikulincer et al., 2004; Mikulincer,

Brinbaum, Woodis & Nachmias, 2000) causing a rebound effect and demonstrate similar emotional reactivity as people who are more anxiously with respect to attachment. Under lower cognitive demands, however, it is often found that avoidant individuals are usually able to suppress their emotional response enough to allow their behaviour to be uninterrupted, similar to the behavioural reactions of more securely attached individuals, sometimes even demonstrating superior performance on attention tasks (Ein-Dor et al., 2012; Gillath et al., 2009a; Mikulincer et al., 2002; Mikulincer & Shaver, 2016).

Secondly, attachment orientation to parents and teammate were chosen as a way of including (and comparing) a sport specific relationship, to a non-sport specific relationship. Additionally, attachment orientation to parents are likely to represent individuals underlying or stable attachment 'prototype' (Hudson et al., 2015) and share closer ties to athletes' attachment state of mind (i.e., the outcome classification based on the clinical Adult Attachment Interview).

Chapter 3: Methods

Participants

Eighty-eight competitive basketball players were recruited from local high schools and universities in the Niagara, Ontario area. All players were in the middle to end portion of their season. Team coaches were contacted through publically available phone numbers or emails and offered the letter of invitation. A final sample size of 64 participants completed all three components of the study (i.e., self-report measures, low pressure performance condition and high pressure performance condition) due to athletes' injury or illness. According to Tabachnick and Fidell (2007), a sample of $50 + 8(iv)$ is required for a multiple linear regression model. Since each regression equation had two independent variables (attachment anxiety and attachment avoidance scores from each relationship) a sample size of 66 would have been optimal and matched Wang et al.'s (2004a) study on coping styles and choking susceptibility in basketball players.

Sport Motor Task

The motor task used was basketball free throw shooting. Free throw shooting is a fine motor task requiring a relatively narrow focus of attention and moderate arousal level (Wang et al., 2004a, p.79). This task involves synchronizing movements between the legs, back and shoulders in order to shoot the ball with a smooth evenly paced lifting motion. Previous research has used basketball free throw shooting to experimentally examine attention, choking and performing under pressure in sport (e.g., Geukes, Mesagno, Hanrahan & Kellmann, 2013; Mesagno, Harvey, Janelle, 2012; Mesagno, Marchant & Morris, 2009; Wang et al., 2004a; Wang, Marchant, Morris & Gibbs (2004); Wilson, Vine & Wood, 2009; Vickers, 1996). The free throw was chosen because it is a “well learned or overlearned skill” (Wang et al., 2004b, p.182) for competitive basketball

players. Therefore, if changes in performance were evident, it would reduce the likelihood that those differences could be attributed to skill or experience.

Experimental Conditions

This study used high and low pressure manipulations in order to observe whether athletes attachment orientation related to their sport performance under different amounts of pressure (i.e., threat). This study also aimed to replicate the experimental design of Wang et al.'s (2004a) study on coping styles and susceptibility of choking under pressure, while also integrating influences from Geukes, Mesagno, Hanrahan and Kellmann's (2013) study, that used a mixed pressure protocol (i.e., combined motivational and self-presentational pressure) to investigate the influence of trait differences (i.e., private and public self consciousness) on performance under different types and levels of high pressure. Although the 'high' and 'low' pressure conditions maintained a certain amount of ecological validity due to the applied setting (despite technically being a 'laboratory' simulation), the high-pressure (HP) condition was not expected to reflect the amount of pressure experienced in real world competition situations, nor was the LP expected to exactly equate pressure that is similar to shooting baskets alone. The aim was to create significantly different amounts of pressure in each condition so that different amounts of stress/threat would be experienced.

Measures

Demographics. Participant demographics (see Appendix C) were collected, including gender, age, number of days/hours trained per week, number of years on their current school team, whether they are a member of another basketball team (e.g., club

team/travel team), starter status, and current free throw percentage/estimated free throw percentage/expected score out of twenty.

Attachment Orientation. To assess individual differences in attachment orientation, participants completed the Experiences in Close Relationships-Relationship Structures questionnaire (ECR-RS; Fraley, Heffernan, Vicary, & Brumbaugh, 2011, see Appendix D). The ECR-RS was designed to assess attachment orientation separately, in four relational domains: mother, father, romantic partner and (non-romantic) best friend. Fraley and colleagues (2011) have recommended using any one or more of the relational domains, depending on the research purpose, or to adapt the relational domain to reflect other important relationships. In each domain, participants are asked to respond to nine items that assess attachment orientation by rating which number on a 7-point Likert scale (strongly disagree to strongly agree) most accurately represents their feelings in a particular close relationship. Within each relational domain, the ECR-RS assesses, and gives a score for each of the two underlying attachment dimensions: attachment related avoidance (items 1-6) and attachment related anxiety (7-9). Attachment-related anxiety concerns the extent to which a person is worried that the target may reject him or her (e.g., “I’m afraid that this person may abandon me”), whereas attachment-related avoidance concerns the extent to which people are uncomfortable with closeness and dependency (e.g., “I don’t feel comfortable opening up to this person”). On the low end of both dimensions, are people who are more comfortable using others as a secure base and safe haven (“I find it easy to depend on this person”), prototypically a securely attached person.

Mother/mother-like figure, father/father-like figure and closest teammate (best friend on the team) relationships were assessed in the current study. Due to the scope of

this study, and the potential variation in experiences with romantic relationships within this sample, the romantic attachment domain was not included. The best friend relational domain of the ERC-RS was modified to include an assessment of athletes' nominated *closest teammate* attachment orientation. The ECR-RS was formulated out of the widely used ECR-R (Fraley, Waller & Brennan; 2000) using a large sample of 21,000. The ECR-RS has shown a reliable, similar structure to results produced by other attachment measures (Fraley et al., 2011; 2015). The ECR-RS has been validated for use with adults (Fraley et al., 2011; Fraley et al., 2015; Hudson et al., 2015) and adolescents (Donbaek & Elklit, 2014).

The Mental Readiness Form-3. The Mental Readiness Form-3 (MRF-3; Kane, 1994, see Appendix E) was used to assess athletes' competitive state anxiety in both experimental pressure conditions in a brief manner. It served mainly as manipulation check for pressure and to ensure that performance outcomes were not solely the result of competitive anxiety. Athletes rated their level of competitive state anxiety on 3 single item assessments ranging between 1-11; cognitive anxiety ("My thoughts are: worried/not worried"); somatic anxiety ("My body feels: tense/not tense"); and self-confidence ("I am feeling: confident/not confident"). The MRF-3 items have shown moderate to strong concurrent validity with corresponding CSAI-2 subscales and measures of trait anxiety in sport (Krane, 1994).

Performance. Total number of successful free throws out of twenty, in each pressure condition, represented performance outcomes and the dependent variable. By calculating a performance change score between performance in the low pressure (LP) and the high pressure (HP) condition, the dependent variable became a 'performance

differential score' (i.e., HP – LP) for each athlete. In this way, the performance differential score represented each athlete's change in performance under high pressure. Performance scores were either positive (+), negative (-) or no change (=0).

Procedure

Ethical approval from Brock University's Research Ethics Board was granted prior to participant recruitment and data collection. Senior high school and university (varsity) basketball coaches were contacted via email or by phone and offered the letter of invitation (Appendix A). The letter of invitation invited competitive basketball players to participate in a study entitled "Individual Differences, Shooting Style and Accuracy in Competitive Basketball Players".

On Day 1, the primary researcher visited the home gym of the basketball team where participants were given a brief overview of the study (i.e., overview of letter of invitation and informed consent form). Participants were then provided time to read the letter of invitation and informed consent form (Appendix B), and signed the consent form if they still wished to participate in the study. On the informed consent form and during the informed consent process, participants were advised that their shot performance would be video recorded as part of a larger, ongoing research project by the Coaching Association of Canada (CAC) (as part of the bogus statement pressure manipulation) and that all participants were guaranteed to be compensated a minimum of \$5.00 for their participation in the study. Following the informed consent processes, participants were given the demographics form (Appendix C) and the measure of attachment orientation to mother, father and closest teammate (ECR-RS; Appendix D). The measures of attachment orientation were counterbalanced.

Approximately one week later, (day 2) two researchers (i.e., the primary researcher and a research assistant) returned to the team's home gym facility. Participants were taken alone into a separate gym where they were explained the instructions for the low-pressure (LP) condition, which simply asked them to attempt twenty free throws and being as accurate as possible. The primary researcher was keeping score, while the research assistant stood underneath the basketball net and returned the basketball between shots. Participants were advised that they would be informed when there were ten shots remaining, and to pause prior to shooting the next round of attempts. Prior to the task, participants completed the MRF-3 and a two-minute warm-up period.

Approximately one week later, (day 3) three researchers (i.e., the primary researcher and two research assistants) returned to the team's home gym for the high-pressure situation. For the HP condition, the same procedure that took place as in the LP condition was, however, additional information was added to the instructions in order to manipulate the amount of performance pressure experienced. Firstly, in the HP condition, participants were told the following bogus statement "Today's procedure will be similar to last time. You will still take 20 free throw shots but today, we will be video recording your performance during your free throw attempts (not during your warm up) as part of a larger ongoing study by the Coaching Association of Canada that is looking at how competitive basketball players' individual shooting style relates to their shot accuracy, which will be reviewed for a new skill execution training module". Additionally, participants were offered performance contingent financial incentives as a way to increase the pressure to perform (Wang et al, 2004a). They were told that, "Another difference today, is that you will be paid for your performance. Specifically, you will receive \$1.00 dollar for every basket you match to your score from last week (LP

condition). Additionally, if you exceed your score from last week, you will receive an additional \$4.00 for each basket you make above your expected score. However, if the reverse occurs, and you make fewer baskets than you did last time, we will take off \$4.00 from your total". For instance, if a participant scored 14/20 shots in the LP condition and 15/20 in the HP condition, they would receive a total of \$18.00 (i.e., $(\$1.00 \times 14) + (\$4.00 \times 1) = \$18.00$). Alternatively if they had scored 14/20 in the LP but only 12/20 in the HP condition, they would receive a total of \$5.00 (i.e., $(\$1.00 \times 12) - (\$4.00 \times 2) = \$5.00$). Once participants completed the HP condition, they were paid accordingly and thanked for their participation and asked not to communicate any of the instructions or information to their teammates, coaches or other participants until everyone completed the study. Participants were then debriefed at the end of day 3 (Appendix F).

Design and Analysis

This study used a repeated-measures experimental design. Competitive state anxiety scores from the MRF-3 served as a manipulation check to ensure that the manipulation of pressure significantly increased from the HL condition to the HP condition. Preliminary analyses assessed performance differences by gender (male/female) and team level (high school/university). Correlational analyses ensured that predictor variables were not correlated to outside demographic variables. After checking assumptions of multiple linear regression, the main hypotheses between attachment orientation and performance differential were tested, running three simultaneous multivariate regressions (one for mother/mother-like figure, father/father-like-figure and closest teammate) using performance change scores as the dependent variable and attachment anxiety and attachment avoidant scores as predictor variables.

Chapter 4: Results

Descriptive Statistics and Preliminary Analyses

Table 1 displays means and standard deviations for participants' attachment avoidance and anxiety scores in the assessed relationship, average performance scores in the low-pressure (LP) and high-pressure (HP) condition, and average performance differential scores. The Cronbach's (1951) alphas for mother anxiety ($\alpha = .82$) and avoidance ($\alpha = .85$), father anxiety ($\alpha = .87$) and avoidance ($\alpha = .885$), as well as teammate anxiety ($\alpha = .78$) and avoidance ($\alpha = .71$) scores are within the range of reliable values for diverse psychological constructs according to Kline (1999). Mean

Table 1

Means and Standard Deviations for Attachment Orientation and Performance Scores

	Total <i>N</i> =64	Males (<i>n</i> = 51)	Females (<i>n</i> = 13)	University (<i>n</i> = 22)	High School (<i>n</i> = 42)
Mother Anxiety	1.24 (0.93)	1.30 (1.03)	1.03 (0.10)	1.08 (0.23)	1.33 (1.13)
Mother Avoidance	1.99 (1.11)	2.18 (1.17)*	1.25 (0.29)*	1.56 (0.66)*	2.22 (1.24)*
Father Anxiety	1.49 (1.27)	1.49 (1.17)	1.54 (1.66)	1.21 (0.73)	1.65 (1.47)
Father Avoidance	2.68 (1.43)	2.79 (1.35)	2.26 (1.72)	2.26 (1.28)	2.90 (1.47)
Teammate Anxiety	1.92 (0.97)	1.96 (1.02)	1.77 (0.76)	1.83 (0.82)	1.97 (1.05)
Teammate Avoidance	2.66 (1.03)	2.80 (0.95)*	2.14 (1.20)*	2.46 (1.21)	2.77 (0.92)
LP Performance	14.47 (2.99)	14.41 (3.18)	14.69 (2.98)	16.14 (2.12)*	13.60 (3.04)*
HP Performance	14.86 (3.35)	14.41 (3.46)*	16.62 (2.26)*	17.23 (1.97)*	13.62 (3.28)*
Perf. Differential	0.39 (3.03)	0.00 (3.10)*	1.92 (2.25)*	1.09 (2.27)	0.02 (3.33)

* = $p < 0.05$

scores for attachment anxiety and avoidance were below the scale midpoint (i.e., 4), indicating that athletes in this sample would be classified as relatively secure with respect to attachment in the assessed relationships. The only difference in attachment scores between high school and university athletes was that high school basketball players ($n = 42$; $M = 2.22$; $SD = 1.24$) reported significantly more avoidance with their mother/mother-like figure compared to university basketball players ($n = 21$; $M = 1.56$; $SD = .66$) ($t(59.90) = 2.73$, $p = .008$, $d = .66$). Likewise, males ($n = 51$; $M = 2.18$; $SD = 1.17$) reported significantly more avoidance with their mother/mother like figure than females ($n = 13$, $M = 1.25$, $SD = .29$) ($t(59.90) = 5.02$, $p = .000$, $d = 1.09$) and males ($n = 50$, $M = 2.80$, $SD = .95$) compared to females ($n = 13$, $M = 2.14$, $SD = 1.2$) also reported significantly more avoidance with their closest teammate ($t(61) = 2.093$, $p = .041$, $d = .60$).

Participant's scores in the LP and HP condition was the total number of successful free throws scored out of the 20 attempted shots. The performance differential score was calculated for each participant by subtracting the LP score from the HP score. According to the protocol used by Wang et al. (2004a), negative scores "reflect an inability by the participant to maintain or improve their performance under pressure" (p. 82), whereas positive scores would be indicative of the opposite, thus, being able to improve or thrive under pressure. Overall shooting performance did not significantly differ between participants' LP performance ($M = 14.47$; $SD = 2.99$) and HP performance ($M = 14.86$; $SD = 3.35$), and performances in the experimental pressure conditions were positively and moderately correlated with each other ($r = .55$, $p < .01$). Out of 64 participants, 10 (15.6%) players matched their LP score in the HP condition (a neutral performance differential), 24 players (37.5%) had negative differential scores

(performance decrement from LP to HP), and 30 players (46.9%) had positive differential scores (performance improvement from LP to HP). This suggests that the majority of basketball players (62.5%) in this sample either maintained or improved their performance under high pressure.

No significant differences were found between males ($n = 51$; $M = 14.41$; $SD = 3.18$) and females ($n = 13$; $M = 14.69$; $SD = 2.25$) in the LP condition ($t(62) = -.30$, $p = .766$, $d = .10$), however females ($M = 16.62$; $SD = 2.26$) performed significantly better compared to males ($M = 14.41$; $SD = 3.46$) in the HP condition ($t(62) = -2.18$, $p = .033$, $d = .76$). Females ($M = 1.92$; $SD = 2.25$) also had significantly greater performance differential scores in the positive direction compared to men ($M = .00$; $SD = 3.10$) ($t(62) = -2.1$, $p = .040$, $d = .71$). On average, university basketball players ($n = 22$; $M = 16.14$; $SD = 2.12$) compared to high school basketball players ($n = 42$; $M = 13.60$; $SD = 3.04$) had significantly greater performance in the LP ($t(62) = -3.50$, $p = .001$, $d = .97$). In the HP condition, university players ($M = 17.23$; $SD = 1.97$) also performed significantly better than high school players ($M = 13.62$; $SD = 3.28$) ($t(62) = -4.73$, $p = .000$, $d = -1.33$), but showed no significant differences were found between high school ($M = .02$; $SD = 3.33$) and university ($M = 1.09$; $SD = 2.27$) players' performance differential scores ($t(62) = -1.35$, $p = .183$, $d = -.38$).

Manipulation Check

To assess whether the experimental manipulation successfully increased perceptions of pressure from the LP condition to the HP condition, three paired samples t -tests were used to analyze differences in participants responses on each competitive anxiety item from the MRF-3; somatic anxiety, cognitive anxiety and self-confidence. Table 2 shows the mean MRF-3 item scores for the LP and HP conditions. No significant

Table 2

Means and Standard Deviations for Competitive Anxiety MRF-3 Subscale Scores in Low-Pressure and High-Pressure Conditions (N = 64)

	Low Pressure	High Pressure
Cognitive Anxiety	2.69 (1.87)	3.00 (2.08)
Somatic Anxiety	4.25 (2.46)	4.33 (2.58)
Self-Confidence	8.08 (1.84)	7.96 (2.36)

differences ($p > .05$) were found between the LP and HP condition on athletes' self reported cognitive anxiety ($t(50) = -1.08, p = .287, d = -0.16$) somatic anxiety ($t(50) = -0.222, p = .826, d = -0.03$) or self-confidence ($t(50) = .454, p = .652, d = .06$) scores of the MRF-3 items.

Checking Assumptions of Multiple Linear Regression Analyses

Prior to assessing the relationship between attachment orientation and performance differential, the assumptions for a multiple linear regression analysis in SPSS were verified. Scatter plots were inspected to visually meet the assumption of linearity and homoscedasticity by viewing the standardized residuals against standardized predicted values (Field, 2013). Nine scatter plots were inspected; three between the attachment predictor variables (i.e., anxiety or avoidance scores) and the dependent variable (i.e., performance differential) for each attachment relationship (mother, father, closest teammate), and three between the attachment and anxiety scores predictor variables within each relationship (e.g., between mother anxiety and avoidance). The scatter plots illustrated weak linear relationships, despite various outliers.

Heteroscedasticity could also be assumed once the scatter plots were inspected, showing equal and comparable standardized residuals.

In order to meet the assumption of normal distribution of error in the current small sample, bootstrapping was employed with the regression analyses. Although predictor variables are not expected nor do they need to be normally distributed for regression analyses, in smaller sample, a lack of normality will invalidate parameter estimates and significance tests, whereas in large samples it will not due to the central limit theorem (Field, 2013). According to Field (2013), if you bootstrap parameter estimates, this assumption can essentially be ignored.

Independence of error was established using the Durbin-Watson test, which “tests whether adjacent residuals are correlated” (Field, 2013, p. 311) to ensure that the residuals in the model are independent. This statistic ranges from 0 to 4, where a value of 2 indicates uncorrelated residuals. Values greater than 2 indicate a negative correlation whereas values lower than 2 indicate a positive correlation. According to Field (2013), as a very conservative rule, values lower than 1 or greater than 3 may be a cause for concern. In the current sample, attachment orientation (i.e., anxiety and avoidance scores) to mother = 2.16, attachment orientation to father = 2.24, and closest teammate = 2.16). All values were close enough to 2 (not below 1 or above 3) and therefore, the assumption was met.

To check for evidence of multicollinearity within the data, the variance inflation factor (VIF) and Tolerance statistic from SPSS’s collinearity diagnostics was included in the regression analyses to ensure that the predictor variables (i.e., attachment anxiety and avoidance) do not share a linear relationship (Field, 2013). According the Field (2013), if the VIF is less than 10 and the Tolerance is above 0.2, it is safe to conclude that there is

no concerning collinearity between predictors (mother $VIF = 1.10$, $Tolerance = 0.91$; father ($VIF = 1.26$, $Tolerance = 0.80$); closest teammate, $VIF = 0.82$, $Tolerance = 1.22$).

Therefore, this assumption was met.

Correlation Analyses

Table 3 displays bivariate correlations between attachment anxiety and attachment avoidance scores in each relationship and performance differential. No significant correlations were found between anxious or avoidant attachment scores and the performance differential score in any of the assessed attachment relationships.

Significant correlations were found between mother attachment anxiety and mother avoidance ($r = 0.31$, $p < .05$), mother anxiety and father anxiety ($r = 0.43$, $p < .01$) as

Table 3

Bivariate Correlations between Attachment Orientation and Performance Differential

	Mother Anxiety	Mother Avoidance	Father Anxiety	Father Avoidance	Teammate Anxiety	Teammate Avoidance	Perform. Diff.
Mother Anxiety	1	.31*	.43**	.10	.37**	.22	-.13
Mother Avoidance		1	.02	.29*	.01	.25*	-.01
Father Anxiety			1	.45**	.09	.02	-.01
Father Avoidance				1	-.09	.13	.02
Teammate Anxiety					1	.42**	-.11
Teammate Avoidance						1	-.07
Perform. Differential							1

* = $p < 0.05$

** = $p < 0.01$

well as mother anxiety and closest teammate anxiety ($r = 0.37, p < .01$). Mother attachment avoidance significantly correlated with closest teammate avoidance ($r = 0.25, p < .05$) and father attachment anxiety significantly correlated with father attachment avoidance ($r = 0.290, p < .01$). Teammate attachment anxiety and avoidance were also significantly correlated ($r = 0.421, p < .01$). No significant correlations were found between attachment anxiety or avoidance and performance in the LP or HP condition for any of the three relationships ($p > .05$). Attachment scores were also uncorrelated with other performance related demographic variables such as expected free throw performance/free throw percentage, current year on team, starter status or amount of training.

Multiple Regression Analyses

Three multiple linear regression analyses were used to test the main hypothesis between attachment orientations and performance differential score. All regression analyses were bootstrapped. Results revealed that attachment anxiety and avoidance to mother were not significant predictors of performance differential scores ($R^2_{\text{adj}} = -.013, F(2,59) = .601, p > .05$). Similarly, attachment anxiety and attachment avoidance to father were not significant predictors of performance differential ($R^2_{\text{adj}} = -.033, F(2,60) = .017, p > .05$). Lastly, closest teammate anxiety and closest teammate avoidance scores did not predict performance differential scores ($R^2_{\text{adj}} = -.019, F(2,60) = .427, p > .05$). Therefore, attachment orientation was not significant a predictor of free throw performance under pressure in this model.

Chapter 5: Discussion

The purpose of this study was to examine the predictive value of attachment orientation on performance change under pressure on a sport motor task (i.e., basketball free throw). Results of the regression analyses did not support the stated hypotheses; attachment orientation to mother, father or closest teammate did not predict performance outcomes in a sample of competitive high school and university basketball players. However, participants' self-reported experience of competitive anxiety (i.e., pressure manipulation check), in addition to their free throw performance, did not significantly change between the low pressure (LP) and high pressure (HP) condition. This may suggest that athletes' did not experience (or report) a sufficient increase in performance pressure (i.e., threat) from the LP to the HP condition. Therefore, it is unclear whether the null findings reported here are the results of the unique characteristics of the sample, the pressure protocol employed, or truly reflect the absence of a relationship between attachment and performance under pressure.

This was the first known study to investigate the predictive influence of attachment orientation on performance under pressure on a sport motor task. Due to the limited research on attachment and individual sport performance (Carr, 2012a, 2012b; Dizdari et al., 2013; Ein-Dor et al., 2012), it was not certain whether this particular sport situation (i.e., free throw performance under pressure) would be a trigger of attachment behavioural system activation (Carr, 2012a). Based on Forrest's (2008) proposal that insecurely attached athletes likely have poor attentional flexibility under competitive stress, as well as research on individual differences in attachment in the context of sport (e.g., Carr, 2012a; Dizdari et al., 2013; Ein-Dor et al., 2012) and the broader social psychological literature (e.g., Dewitte et al., 2007; Ein-Dor et al., 2010; Gillath et al.,

2009; Mikulincer et al., 2004), it was proposed that differences in athletes' degree of attachment avoidance and anxiety would be predictive of performance change between low and high performance pressure. Specifically, it was expected that athletes' with higher levels of attachment anxiety would predict the largest decline in performance from the LP to the HP condition (i.e., largest negative performance differential scores), whereas basketball players who reported higher levels of attachment avoidance would predict the highest levels of performance in the LP condition, with *either* a decline in performance in the HP condition (similar to those higher in anxiety, but to a lesser degree) *or* would maintain their performance across LP and HP conditions (i.e., negative or neutral performance differential scores). However, as stated above, the results of the main analysis did not support these hypotheses. Competitive basketball players' self-reported scores of attachment anxiety and avoidance to mother, father, or their closest teammate were not significant predictors of performance change under low to high levels of performance pressure. These results suggest that attachment orientation does not influence basketball free throwing performance under pressure, and tentatively, that sport performance pressure may not be a trigger for attachment behavioural system activation in competitive basketball players.

These results are surprising considering the robust evidence from the attachment literature linking individual differences in attachment to differences in appraising stressful stimuli, reactions to, and coping with stressors, attention, and performance (e.g., Campbell et al., 2001; Dewitte et al., 2007; Dizdari et al., 2013; Ein-Dor et al., 2010, 2012; Larose et al., 2005; Lopez & Gormley, 2002; Mikulincer et al., 2002; Mikulincer et al., 2004; Mikulincer & Shaver, 2016; Pines, 2004; Simmons et al., 2009; Van Emmichoven et al., 2003). For example, research on attachment and attention by Gillath

et al. (2009a) found that greater levels of attachment avoidance predicted superior performance on two types of non-attachment related attentional tasks; the ability to switch attention quickly and affectively from one task to another (psychological refractory period task), and the ability to control attention (i.e., executive control) in the face of distractors (a flanker task). Additionally, other research (e.g., Mikulincer et al., 2002; 2004) has shown how the attentional resources of avoidant individuals (i.e. deactivating strategies) often break down under high cognitive or emotional loads, triggering (or revealing underlying) negative self-representations (Mikulincer & Shaver, 2016). On the other hand, attachment related anxiety has been associated with difficulties suppressing attachment related thoughts and negative self-representations regardless of the experimental situation being neutral, low, or under high cognitive or emotional load; supporting the notion that individuals with higher levels of attachment anxiety (who use hyperactivating strategies) likely have a chronically activated attachment system (Mikulincer, 1995; Mikulincer et al., 2004; Mikulincer & Shaver, 2003; Mikulincer & Shaver, 2016). Moreover, in Gillath et al.'s (2009a), mentioned above, it was discovered that when participants high in attachment avoidance were primed to recall and write about a past insecure relationship (i.e. an insecure attachment prime), their attentional advantages (i.e. deactivating strategies) essentially vanished, leading the authors to suggest that avoidant individuals have skilled attentional control on general attention tasks, but reminders or triggers of attachment insecurities can interfere with their superior performance. Additionally, Maunder, Lancee, Nolan, Hunter and Tannenbaum (2006) discovered that people with high attachment anxiety, perceive and report a greater distress response when confronted with a stressor (i.e., remembering a stressful event from the past month), despite physiological evidence (i.e., heart rate measures) that

showed no significant impact. The opposite pattern was found for avoidant individuals; they did not perceive or report distress following confrontation with the stressor, however, their physiological responses indicated greater physiological changes indicative of distress than anxious participants. In Kim (2006), significant physical reactivity among anxiously attached individuals was observed, but *only* when high levels of distress were reported (Mikulincer & Shaver, 2016). These patterns of behaviour suggest that participants high in attachment anxiety have the tendency to exaggerate their distress when confronted by a stressor/threat, which “contrasts with avoidant individuals’ dissociation between subjective reports of lack of distress and heightened physiological reactivity” (Mikulincer & Shaver, 2016, p. 207).

Differences in attachment, attention and performance have also been documented beyond laboratory-based research. For example, Larose et al. (2005) found that the transition from high school to college negatively impacted the learning dispositions (e.g., examination preparation, quality of attention, help-seeking from teacher) and grades of insecurely attached students (classified using the AAI), but not students classified as secure-autonomous (i.e., low attachment anxiety and avoidance). Insecure-dismissive (i.e., high attachment avoidance, low attachment anxiety) students’ quality of attention also mediated the relationship between their attachment style and poor academic performance. The authors note, however, that despite some differences between insecure-preoccupied (i.e., high anxiety and low avoidance) and insecure-dismissive (i.e., low anxiety and high avoidance) students, their overall findings most strongly support the buffering effects of a secure attachment (Bowlby, 1969/1982, 1973, 1980; Mikulincer & Shaver, 2003, 2016, 2017). In line with attachment theory (Bowlby, 1969/1982, 1973, 1980), Larose et al.’s (2005) findings support that a history of attachment security (i.e.,

lower scores on the anxiety and avoidance dimensions) better prepares students for exploration and performance success in college by providing stable cognitive, emotional and behavioural resources.

In terms of real world behavioural differences in athletic performance, Ein-Dor et al. (2012) showed that an avoidant orientation significantly predicted higher rankings among singles tennis players (aged 9-16) at six time points across 16 months, and that this was the best predictor over and beyond the contributions of training (days/hours), emotional self-efficacy and problem focused coping. This research suggests that having higher levels of attachment avoidance defined as having difficulty trusting others' goodwill, striving to maintain independence, deemphasizing distress and vulnerability, attempts to cope with stress without seeking others' support and use of deactivation strategies, may benefit athletic success and performance in individual sports (Ein-Dor et al., 2012). Despite evidence supporting the cognitive, emotional and behavioural patterns of individuals' with similar attachment characteristics (e.g., Mikulincer & Shaver, 2016), performance on a well-learned sport motor task, under the level and type of pressure simulated in the current design was not predictable via attachment orientation in the assessed relationships.

Carr's (2012a) perspective on the applicability and measurability of attachment in the domain of sport may shed light on the null results reported in the current study. He cautions that the "attachment system may not be an equally powerful 'driver' of coping resources in *all* stressful situations" (Carr, 2012a, p.81) and reminds researchers that attachment "vulnerability factors in relation to cognitive reactions to threat, coping mechanisms, and pain response has tended to come almost exclusively from the social psychological tradition" (p.88). With respect to the current study, Carr's (2012a)

statement can be taken to mean that activating the attachment system in sport, and subsequently observing the influence of an activated attachment system on performance, may be more or less influential based on the specific sport situation (e.g., level of alarm caused by the stressful or threatening stimuli (e.g., amount or type of pressure experienced; Geukes et al., 2013), the presence or absence of attachment figures, fatigue, unexpected or unfamiliar conditions or occurrences, familiarity of the task etc.; Bowlby, 1969/1982, 1973). Therefore, it is simply possible that the nature of free throw performance under pressure is not an activating trigger of the attachment behavioural system for competitive basketball players, and why attachment anxiety and avoidance did not predict changes in performance. It is also possible that the experimentally constructed pressure conditions did not activate the attachment system for various reasons.

Firstly, participants (i.e., competitive basketball players) in the current study did not report significant increases in levels of competitive anxiety from the LP to the HP condition (i.e., pressure manipulation check). Likewise, no significant difference was found between athletes' overall performance in the LP condition and the HP condition. These findings were unexpected and potentially has important methodological contributions for future research aiming to investigate performance under pressure with competitive athletes, especially considering sport research (e.g., Wang et al., 2004a, 2004b; Wilson, Vine & Woods, 2009) often uses the strategy of combining pressure manipulations (i.e., 'mixed' pressure manipulations) to simulate pressure (Geukes, Mesagno & Larkin, 2015; Geukes et al., 2013; Mesagno et al., 2012).

It was the aim of the current study to replicate Wang et al.'s (2004a) experimental design, which found significant differences in reported competitive anxiety between the LP and HP as a means of investigating differences in coping styles (i.e., approach versus

avoidance) on free throw performance under pressure. The current study also added minor influences from the pressure manipulation used in Geukes et al.'s (2013) study on trait differences that influence performance under different types of pressure. In Wang et al. (2004a), the researchers used contingent financial incentives as a reward for superior performance and video recorded athletes' performance of the free throwing task during the HP condition. These manipulations were replicated in the current study, but in addition, influenced by Geukes et al.'s (2013) study, a bogus statement (i.e. "your shot performance will be video recorded as part of a larger, ongoing research project by the Coaching Association of Canada that is investigating shooting style and shot accuracy") was included as a way of explaining the reason behind the video recording of athletes' performance. The 'bogus statement' addition to Wang et al.'s (2004a) design was an added attempt to increase the amount of pressure in the HP condition by creating an illusion of importance, desire and motivation (i.e., ego relevance/ego threat), so that athletes' wanted to perform well (Baumeister & Showers, 1986; Wilson & Vine, 2009). Even with this addition to Wang et al.'s (2004a) design, and despite the effortful aim to instil performance pressure to create distinct high and low pressure conditions, the results showed that competitive anxiety (i.e. MRF scores) and performance (i.e. performance differential scores) may not have been significantly affected by performance pressure for this sample of competitive basketball players.

According to Geukes et al. (2013), the current study would be categorized as a 'mixed' (p. 53) high pressure simulation, which combines motivational (e.g., monetary incentives) and self-presentational (e.g., audience, video recording) cues. Based on the manipulation check and the lack of change in performance, it would appear that the mixed pressure protocol used in the current study may not have created *enough* of an

increase in pressure between the LP and HP condition for competitive basketball players, and/or, that the experimental conditions both simulated a *similar type* of performance pressure (Geukes et al., 2013; Geukes, Mesagno, Hanrahan, Kellman, 2013). Although discussions surrounding the inclusion of manipulation checks have been controversial (Fayant, Sigall, Lemonnier, Retsin & Alexopolous, 2017), and their inclusion should not be used as a way to refute or support causal results or construct validity (Sigall & Mills, 1998), manipulation checks can still be somewhat informative when results are non-predicted (Fayant et al., 2017). Keeping this in mind, some potential reasons as to why a distinction between the experimental pressure conditions (via manipulation check or mean performance between LP and HP) may not have occurred in the current study are discussed below.

A study by Mesagno, Harvey and Janelle (2012) on the association between choking under pressure and trait differences in ‘fear of negative evaluation’ (FNE) among experienced basketball players, differed from the current study in that participants completed a ‘familiarization condition’ prior to completing a basketball shooting task under low and high pressure conditions. The familiarization phase allowed participants to perform the task (i.e., fifty shot attempts from five locations on the court) and run through the procedure prior to the LP and HP conditions, when their performance and competitive anxiety was measured. The purpose of the familiarization phase was to control for the fact that “participants are generally more nervous when they arrive for a research experiment, which is usually reflected in slightly higher anxiety scores, due to the uncertainty of procedures”(p.63). Since the current study did not include a familiarization phase, it is possible that participants had slightly elevated reports of competitive anxiety in the LP condition, leading to a reduced difference in athletes’

comparative experiences of the LP and HP condition during the HP condition, and thus more similar reports of competitive anxiety were recorded between the pressure conditions.

The lack of counterbalancing *may* have interfered with the manipulation of pressure in the HP condition for similar reasons discussed above. It is possible that the athletes' familiarity with the task in the HP condition, and with the primary researcher, may have reduced their experience of pressure due to practice/order effects. However, the decision not to counterbalance followed Wang et al.'s (2004a) reasoning, that when high pressure testing precedes low pressure testing, it can alter the motivation for participants who complete the conditions in that order. They reasoned that not counterbalancing actually makes choking or under performing due to situational changes (i.e., pressure/threat) "harder to induce because under the power law of practice individuals should improve from the low pressure to the high pressure test" (Wang et al., 2004b, p. 182) because the high pressure condition will always have a practice advantage over the low pressure condition and any change in performance will have to be larger than the practice effect. Not counterbalancing, and still finding significant changes in performance, provides more support Wang et al.'s (2004a) design, but in the case of the current study, not counterbalancing may have possibly contributed to the lack of difference in performance and competitive anxiety outcomes between conditions. In Mesagno et al.'s (2012) design (discussed above), counterbalancing of the LP and HP conditions took place despite the impact that order effects could have had on athletes' motivation during the LP condition for those who completed the HP condition first (Beliack & Carr, 2001; Wang et al., 2004a). Additionally, in Mesagno et al. (2012), the familiarization phase and the LP condition were completed with only the researcher present, while the HP included

monetary incentives, video recording and small audience, similar to the current study. However, their inclusion of the familiarization phase (i.e., three conditions versus two) may have reduced the direct of impact of deficient motivation for athletes who completed the LP last. More specifically, Mesagno et al.'s (2012) task (i.e., fifty shots from 5 locations on the court) potentially gave athletes a more challenging task than the 20 free throws requested in the current study, as well as provided athletes with a greater opportunity to improve across conditions (i.e., three versus two conditions), which positively, may have maintained athletes' motivation throughout the study and helped to balance out the affects of counterbalancing. However, Otten's (2009) investigation of choking versus clutching performers on basketball free throws, it was discovered that 141 out of 201 undergraduate students (32% having previous basketball experience from high school varsity/junior) increased their performance under pressure (i.e., video recording). Otten (2009) attributed this finding to a "warm up effect" (p. 595) since this occurred across both the experimental and control group. Overall, the lack of counterbalancing was not seen as a definite limitation in the current study's design (Wang et al., 2004a) but along with other influences (discussed below) it may have contributed to the similarity of athletes' experience of competitive anxiety under LP and HP.

One potentially significant difference between the current study and Wang et al.'s (2004a), (and Wang et al.'s (2004b) for that matter), was the location of data collection. Data were collected in the home gymnasiums of basketball players in the current study, whereas in Wang et al.'s studies (2004a, 2004b) data were collected in the same basketball stadium (presumably) unknown to participants. This may have reduced the amount of pressure experienced by participants due to the familiarity players have with their home gymnasium. However, in Geukes et al. (2013), which found trait differences

(i.e., public and private self-consciousness, narcissism) predicted significant differences in performance under different types of high pressure, data were collected in the players' home gymnasium during the LP condition and two of the three HP conditions; private HP (which included monetary incentives and a bogus statement) and mixed HP (which included monetary incentives, video recording and a small 'expert' audience). Even though the current study was influenced by the pressure manipulations and design used in both Geukes et al. (2013) and Wang et al. (2004a), significant differences were surprisingly not found between the LP and HP condition in the level of pressure experienced (i.e., competitive anxiety) or in performance outcomes (i.e., performance differential between HP and LP). In terms of attachment behavioural system activation with respect to an unfamiliar location of data collection compared to a 'home gymnasium advantage', a location *not* familiar to participants' would have, theoretically, presented a greater threat to the attachment behavioural system or a 'natural clue of danger' (Bowlby, 1973; Forrest, 2008).

Lastly, with regard to the manipulation of pressure, the contingent monetary incentives may have lacked influence on the performance in the HP condition for this athlete sample. It has been found that if monetary incentives are desirable (e.g., large enough), an increase in motivation and effort can lead to poor performance on well-learned tasks by interrupting processes controlled by the prefrontal areas in the brain and shifts to midbrain areas associated with impulsive behaviour and rewards (Mobbs et al., 2009). Although, athletes' desire or motivation for the monetary reward was not measured in this study, is possible that participants were not motivated to the extent that optimal performance on this well-learned task was interrupted which led to non-significant differences between low and high pressure conditions.

Although there were some differences between the pressure manipulations used in the current study and the research discussed here (i.e., Geukes et al., 2013, Wang et al., 2004, Mesagno et al., 2012), each of those studies found significant changes in athletes' reported competitive anxiety from LP to HP and performance differences between conditions, which speaks to the sensitivity of implementing or closely replicating pressure protocols in applied sport research (Brandt et al., 2014) Marini & Sullivan, 2017).

Based on research from the attachment literature it is also somewhat surprising that anxiety did not significantly change from the LP to HP condition. In the cognitive psychology attachment literature the attachment system is typically activated simply by the presentation of a symbolic threat word such as failure (non-attachment related threat) or separation (attachment related threat) (e.g., Mikulincer et al. 2002). The presentation of these experimental-laboratory threat conditions, are often compared to neutral or non-threatening (e.g., control) conditions (neutral or positive words), and differences in, response time (for example) are measured. The presentation of these words is often also completed at supraliminal and subliminal levels, providing support for the unconscious and conscious nature of the attachment system and the influence it can have on behaviour (Carr, 2012a). Although the methodology of this research is very different from the current study, it shows that even the presentation of a symbolic threat *can* activate the attachment behavioural system. The extent to which the attachment behavioural system was activated in the current study is therefore unknown, since the only indirect indication of such activation would be performance changes or reports of competitive anxiety. Therefore, if there is a relationship between attachment and sport performance under pressure, it would seem that something specific in the current study's design either did

not pose a great enough threat to activate the attachment behavioural system to the extent that it could influence changes in behaviour (performance), or, that performance pressure (at least at low levels) is not an activating trigger for the attachment behavioural system of competitive basketball players.

Although the hypotheses were unsupported, some interesting contributions and mentionable results were uncovered and deserve attention in this section. To date, the ECR-RS has not been used to assess attachment in a sample of athletes. This was the first study to do so and the first to measure attachment orientation to a *closest teammate* in the context of sport. Comparing mean attachment scores from mother, father and closest teammate of the current sample, with mean scores from larger adult and adolescent samples that used the ECR-RS (e.g., Donback & Elklit, 2014; Fraley et al., 2011; Hudson et al, 2015) suggests that on average, this sample of competitive basketball players would be considered relatively secure as a group in the respective relationships. Specifically, although a categorical measure assessing attachment security was not used in this study, mean scores of attachment anxiety and avoidance were below the mid-point of the item scale (i.e., 4). Other research on attachment in sport using athlete samples has shown similar levels of ‘security’ at the group level using both two-dimensional (i.e., low levels of anxiety and avoidance), and using categorical measures of attachment that assess security directly (Carr, 2012b; Davis & Jowett, 2010; Felton & Jowett, 2015, 2017; Tiryaki & Cepikkurt, 2007).

One of the most consistent findings in the attachment literature is the similarity of distribution of attachment patterns across cultures, children, adolescents and adults, with approximately 33% exhibiting in attachment patterns (Ein-Dor et al., 2010). Therefore, it is more likely that the sample size in the current study was either not large enough to see

greater variations (i.e., extreme scores) in attachment anxiety and avoidance, or that the attachment measure (i.e., ECR-RS) was vulnerable to a floor effect or response bias within the current sample of competitive athletes, rather than attachment ‘security’ (reflected by low anxiety and avoidance scores) necessarily being a group characteristic of competitive basketball players. However, if attachment security *is* more common of competitive basketball players or athlete samples (e.g., Dizardi et al., 2013) it would be consistent with Forrest’s (2008) proposal that insecurely attached athletes may be poorly equipped to handle competitive stressors in sport, whereas securely attached athletes may have better experiences in close sport relationships (Carr, 2012b, Ein-Dor et al., 2012, Rom & Mikulincer, 2003) and may experience less burnout or withdrawal over time (e.g., Ein-Dor et al., 2012; Pines, 2004; Ronene & Mikulincer, 2009; Simmons et al., 2009).

Consistent with research on adolescent-parent attachments and sport friendships (Carr, 2009b), the current study found that attachment orientation with a parental figure was reflected in attachment orientation with a closest teammate. Specifically, avoidance with *mother/mother figure* was correlated to attachment avoidance with *closest teammate* ($r = 0.254, p < 0.05$), whereas attachment anxiety with *mother/mother figure* was correlated ($r = 0.365, p < 0.01$) with teammate attachment anxiety. These results may suggest that an athlete’s attachment to their mother are indicative of their internal working model or underlying prototype (global attachment orientation/attachment style) which can subsequently influence their experience in a close teammate relationship (Carr, 2009b; Fraley et al., 2015). Similarity, Carr (2009b) found evidence that adolescent-parent relationships were significantly related to sport friendship experiences in adolescent team sport athletes. Carr (2009b) also discovered that athletes with characteristics reflecting a secure working model outlined by Bowlby (1969/1982), such

as, a sense of empathy towards the attachment figure, respect and appreciation for the needs and feelings of the attachment figure (i.e., *goal-corrected partnership* subscale on the Adolescent Attachment Questionnaire: AAQ; West, Rose, Spreng, Sheldon-Keller & Adam, 1998) predicted more positive sport friendship experiences (i.e. via the Sport Friendship Quality Scale; Weiss & Smith, 1999). Both Carr's (2009b) findings and the results reported here on the similarity between mother attachment orientation and teammate attachment orientation, are in line with the predictions of attachment theory (Bowlby, 1973); early childhood relationships will influence our internal working model and subsequently, our experiences in future close relationships.

Lastly, it should be noted that female basketball players performed better in the HP condition compared to male basketball players; evidenced by having significantly greater performance differential scores in the positive direction. Despite the gender analyses lacking sufficient power, this performance outcome was unexpected, and is potentially an interesting avenue for future research, especially considering that males also reported more avoidance with both their mother/mother-like figure and their closest teammate.

Limitations

There are some potential limitations that may have contributed to the outcomes of the current study. In Wang et al. (2004a, 2004b), it is not clear how many students were included in their audience during the HP condition. In the current study, there were three 'audience' members or observers; the primary researcher and two research assistants. One research assistant was controlling the video camera, and the other passing and returning the ball to the participant. Therefore, it is *possible* that Wang et al.'s (2004a) manipulation of pressure in the HP condition yielded different results from the LP condition because the size of their audience was different from the one used in the current

study. Additionally, it is possible that the presence of two researchers (i.e., primary researcher and the research assistant) in the LP condition of the current study, as opposed to one as in Wang et al. (2004a), may have increased the amount of pressure in the LP condition, and thus, made the amount of pressure experienced in both conditions too similar. In Geukes et al. (2013), the researchers included seven audience members (who were introduced as experts in the field of handball) during their ‘mixed’ HP condition, which, may have elevated the amount of pressure experienced of the competitive athletes in their sample in compared to the current study’s mixed HP condition, since they had both a larger audience and a bogus statement manipulating the participants to believe it was an expert audience. Both the current study and Guekes et al.’s had video recording. Geukes et al.’s (2013) manipulation of ‘private’ HP, however, only included monetary incentives, and video recording with a bogus statement indicating that experts would review the footage, but did *not* include an audience, and still found significant increases in competitive anxiety from LP to HP conditions, as well as significant differences in performance under pressure based on levels of trait private self-consciousness.

Another potentially limiting factor was that the dependent variable in the current study was measured using a ‘performance differential’ score as the measure of performance change between performing under low pressure compared to high pressure. This may have been problematic. Firstly, the usefulness of the performance differential score was at the mercy of a successful manipulation of pressure as well as significant differences between athletes’ performances in the LP and HP condition. Therefore, if, as may be implied by the manipulation check responses (i.e., MRF competitive anxiety scores), participants did not experience a change in pressure between conditions, the simple change score may not have been a good reflection of how athletes’ performance is

affected under different levels or types of pressure. Secondly, if floor effects did influence the attachment scores in the current sample, and because significant differences were not found between athletes' mean performances under LP and HP, according to Zumbo's (1999) model, the residualized change scores should have been used as the dependent variable in the regression model rather than simple change scores.

Similarly, it is also possible that the free throwing task in the current study did not include enough shot attempts to see much variation in athletes performance differential scores (dependent variable), despite the fact that this protocol has yielded significant decreases in performance under pressure in the past (Wang et al., 2004a, 2004b). In Wang et al., (2004a, 2004b), average performance in the LP was 13.56/20 (SD=3.94), and significantly decreased in the HP condition to 12.53/20 (SD=2.51), therefore, a minor change in baskets scored. In Mesagno et al. (2012) experienced basketball players were allotted fifty shot attempts, albeit from various positions on the court. That study investigated the contribution that high and low levels of trait 'fear of negative evaluation' had on competitive anxiety and performance under pressure. In their design, only athletes who were at the extreme ends of this trait were selected to complete the study, which likely led to greater variation in performance (Mesagno et al., 2012), but a having a larger number of shot attempts created a chance for greater variations in athletes' performance to be observed. Having a more demanding task (i.e., more shot attempts) would have also reduced any impact of ceiling effects (Mesagno et al., 2012; Wang et al., 2004a, 2004b). In Mesagno et al.'s study, overall performance significantly changed between the LP and HP condition, whereas performance in the current study did not, and some athletes even improved their performance to reach 20/20 shots under HP.

It is also possible that the using a self-report measure of attachment influenced the results reported here (Forrest, 2008). Forrest (2008) highlighted the fact that self-report methods originated in the social psychological tradition whereas the Adult Attachment Interview is from the clinical tradition and was derived developmental research on infant attachment. In Forrest's (2008) article, she recommended that the categorical Adult Attachment Interview (AAI; which assess athlete's attachment state of mind) would be best for measuring the attachment patterns of athletes in order to harness the implicit and explicit functions of the attachment system and the potential affect attachment insecurity may pose on the attentional flexibility under competitive stress. Using a brief, self-report method to assess attachment (i.e., the ERC-RS) rather than a clinical one (such as the AAI) may have influenced the results between attachment and performance under pressure, since different measurement tools can often yield equivocal outcomes despite convergence in meaning (Carr, 2012a; Forrest, 2008; Mikulincer & Shaver, 2016). Due to the scope and timeline of this project, using the AAI to measure attachment patterns in athletes was not achievable. There is no way to know whether the results would have been different if another attachment measure was used (e.g., self-report-categorical that assessed attachment security directly, or interview/narrative/projective methods), however, it *is* possible to gain insight from the current design as well as the pressure manipulations used in this study. Furthermore, since the selected analysis treated the dimensions of attachment orientation (i.e., anxiety and avoidance) and the different attachment relationships (i.e., mother, father, teammate) as independent, assessing interaction effects was not possible and should be noted as a limitation.

In Wang et al. (2004a) competitive anxiety was taken via the CSAI-2, which showed that competitive anxiety increased from the LP to the HP condition and that the perceived

anxiety was rated as debilitating in the HP condition and facilitative in the LP condition. In this study, the MRF-3 was used as a brief measure of competitive anxiety and as the manipulation check for pressure differences rather than a measure involved in the main analysis. Despite the documented convergent validity between the MRF-3 and the CSAI-2 (Krane, 1994), and the fact that it has been used to measure competitive anxiety similar studies on attention and free throwing (e.g., Wilson & Vine, 2009), it is possible that this tool may not have been the best fit for the time the data was collected (i.e., immediately before data collection) (Thompson, Hanton & Jones, 2002) yielding differences in results.

Future Directions

This study was the first to investigate the influence of attachment on performance under pressure in sport. It is quite possible that the manipulation of pressure in this study was not sufficient in creating distinct high and low pressure conditions, and therefore the relationship between attachment and performance under pressure still deserves investigation. It is recommended that future research on attachment and performance under pressure use ecologically representative, real-world pressure designs in order to simulate the true nature of competitive performance pressure (Geukes et al., 2013), especially with respect to investigating individual trait-like differences with competitive athletes; a population who commonly face real world high-pressure intensity in competition (e.g., large audiences, personal importance, career and identity relevant consequences) (Mesagno, Geukes & Larkin, 2015).

According to Mesagno et al. (2015), simply combining situational factors in laboratory settings to simulate the real world sport competition pressure may not be enough to examine the predictive value of personality traits/variables on individuals' susceptibility to choking or ability to perform under high pressure. Real world or

ecologically representative high-pressure manipulations may be *required* in order for measureable differences in performance to be observed in connection to stable trait or trait-like differences (i.e. trait activation) in research with experienced athletes (Geukes et al., 2013; Mesagno et al., 2015).

Mesagno et al. (2015) commented on the challenge of investigating the predictability of stable trait or personality-related differences when the outcome criteria (e.g., performance) are circumstantially dependent on the characteristics of the situation, such as pressure. They state that researchers are faced with the “difficulty of integrating and explaining the association of two sets of variables that are differently stable over time, due to the variability (i.e., natural fluctuations) of situational measures” (Mesagno et al., 2015, p. 156). To overcome this complexity, Geukes et al., (2013) suggests that identifying traits that are specifically activated under HP (e.g., narcissism), but may not be observable or predictive (i.e., independent) of LP performance (i.e., Lewin’s (1936) interactional approach), might be the key to discovering traits that are crucial for performing under pressure, clutching (i.e., excelling under pressure) or choking under pressure susceptibility. Following an interactional approach (Lewin, 1936), LP and HP would be investigated as distinct situations rather than a dimensional one, that may activate similar or different personality traits or trait-like variables. To investigate personality related differences such as attachment as a predictor variable for performance under high pressure, it may be required that researchers design scenarios where trait differences can be activated. Thus, it might be necessary to use an attachment prime (e.g., recalling a stressor, the presence of an attachment figure, etc.) in order for individual differences to be observable or predictive of performance outcomes. It may also be necessary to compare different types of LP or HP pressure scenarios (e.g., Geukes et al.,

2013) in order to find out whether or how attachment could be related to specific sport situations.

Future research using athletic samples and carefully designed inquiry will also needed to further investigate the extent to which attachment characteristics influence sport performance and participation (Carr, 2009b; 2012a; Forrest, 2008). Acute high pressure experimental manipulations or the impact of prolonged competitive stressors (e.g., monitoring changes across the season, or from pre-season to playoffs) would shed light on the influence of attachment on sport performance under pressure as well as performance across longer bouts of competition stress (Forrest, 2008). For example, researchers could monitor fluctuations in athletes' performance statistics and/or rankings (Ein-Dor et al., 2012; Dizardi et al., 2013) across time (e.g., pre season to post season, years on team etc.) and situation (e.g., home or away performances) while also monitoring changes in attachment relationships (e.g., sport specific; coach, closest, teammate, or outside of sport; parental, romantic partner, best friends). Future research could also investigate attachment patterns in athlete samples at various levels of competition.

Another promising path for future research to follow is to investigate the influence of attachment security priming in sport (e.g., Gillath et al., 2009a; Gillath et al., 2010; Mikulincer & Shaver, 2017; Rosenthal, Walsh, Crisp, Farrow, Waugh, Blissett & Millings, 2012). Specifically, priming a state of 'attachment security' with significant others within the domain of sport (e.g., teammate(s) or coach) or outside that domain (e.g., parents, best-friends, romantic partner) meanwhile monitoring changes in performance under pressure, could provide insight on the influence of attachment characteristics on sport performance (Carr, 2012a, 2012b). Security priming has also been

shown to increase authentic communication (Gillath et al., 2010), which could possibly enhance sport relationship functioning, team cohesion.

Furthermore, as recommended by Forrest (2008), the sport literature on attachment could benefit from the inclusion of clinically rooted assessments (i.e., the Adult Attachment Interview) for assessing attachment patterns (e.g., attachment state of mind) in athletes. According to Forrest, assessing athletes' in this fashion may be more effective for investigating the influence of attachment patterns on sport performance.

Lastly, another interesting avenue for research on attachment and sport performance is the relationship between attachment and mental toughness (Jin & Wang, 2018). Many aspects of mental toughness overlap with cognitive behavioural aspects (i.e., stress appraisals, stress, coping styles, emotional regulation, help-seeking coaching behaviours, etc.) that are influenced by attachment security/insecurity (e.g., Gucciardi & Gordon, 2011; Gucciardi, Hanton, Gordon, Mallet & Temby, 2015; Gucciardi, Gordon, Dimmok, Mallet, 2009; Kaiseler, Polman, Nichols, 2009). Furthermore, Roberts and Woodman (2015) have stated that developmental aspects of mental toughness research is lacking with respect to its' aetiology. It would be interesting to investigate the relationship between mental toughness and attachment especially in the context of sport performance and participation persistence.

Conclusion

It is unlikely that all personality variables will have the same effect on sport performances, and being that performance is a multifaceted construct, it may well be that performances are influenced to varying degrees by multiple personality variables at once (Roberts & Woodman, 2015). Yet, research addressing the isolated or combined influence of personality variables on sport performances, or the interaction between

person variables and specific sport situations, has recently been said to be “lagging by comparison” (p. 17) to the strides that have been made in understanding the impact of strictly environmental influences (Robert & Woodman, 2015). According to Forrest (2008), athletes’ ‘attachment state of mind’ may very well contribute to performance inconsistencies for multiple reasons. Her proposed rationale (from over a decade ago) aligns very well with the recent suggestions from sport researchers Roberts and Woodman (2015), who have recommended that personality research related to sport performance should particularly focus on variables impacted by developmental childhood experiences and come from a strong theoretical basis, beyond the broad Big 5 personality traits. Researching attachment characteristics in relation to sport performance would certainly meet these criteria. Moreover, in their review of contemporary personality perspectives in sport, Roberts and Woodman’s (2015) recognized that personality variables that are known to be influential on sport performances such as narcissism, alexithymia, perfectionism and even optimism, all share the commonality (albeit in different ways) with parental-child interactions, specifically, with regard to parents not being able to meet the needs of their child.

Sport psychologists and consultants (as well as other people who work with athletes) are not unfamiliar with the dilemma of whether to focus primarily on performance enhancement strategies or the well-being of the athlete when a decline in performance (for example) occurs (MacIntyre et al., 2017). Researching the influence of athlete’s attachment characteristics or specific attachment relationships on performance may have the potential to be both a performance enhancement strategy (e.g., priming) as well as improve athletes well being through relationship functioning and satisfaction (e.g., Carr, 2009a, 2009b; Davis & Jowett, 2014).

There is space for self-improvement and self-awareness through relationships. Social relationships are inevitable in sport and life and have the strength to influence our mental health and wellness (Bowlby, 1969/1982, 1973, 1980; Carr, 2012a; Mikulincer & Shaver, 2016). There is great potential in attachment research to enhance performance, participation and satisfaction in sport by gaining greater self-awareness of our confrontations and reactions to stress, loss, failure and a deeper understanding of our behaviour in close relationships.

References

- Ainsworth, M. D. S, Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Allport, G.W. (1966). *Traits revisited*. *American Psychologist*, 21, 1–10.
- Bartholomew, K. (1990). Avoidance of intimacy: An attachment perspective. *Journal of Social and Personal Relationships*, 7, 147-178.
- Baumeister, R. F., & Showers, C. J. (1986). A review of paradoxical performance effects: Choking under pressure in sports and mental tests. *European Journal of Social Psychology*, 16, 361-383.
- Beilock, S. L., & Carr, T. H. (2001). On the fragility of skilled performance: What governs choking under pressure? *Journal of Experimental Psychology: General*, 130, 701-725.
- Bowlby, J. (1969). *Attachment and loss: Vol. 1. Attachment*. New York: Basic Books.
- Bowlby, J. (1973). *Attachment and loss: Vol. 2. Separation: Anxiety and anger*. New York: Basic Books.
- Bowlby, J. (1979/2005). *The making and breaking of affectional bonds*. New York: Routledge (1st Ed. 1979, 2nd Ed. 2005)
- Bowlby, J. (1980). *Attachment and loss: Vol. 3. Loss: Sadness and depression*. New York: Basic Books
- Bowlby, J. (1982). *Attachment and loss: Vol. 1. Attachment*. (2nd ed.). New York: Basic Books.
- Bowlby, J. (1988). *A secure base: Parent-child attachment and healthy human development*. New York: Basic Books.

- Brandt, M. J., IJzerman, H., Dijksterhuis, A., Farach, F. J., Geller, J., Giner-Sorolla, R., ... & Van't Veer, A. (2014). The replication recipe: What makes for a convincing replication?. *Journal of Experimental Social Psychology, 50*, 217-224.
- Bretherton, I. (1992). The origins of attachment theory: J. Bowlby and M. D. S. Ainsworth. *Developmental Psychology, 28*, 759-775.
- Campbell, L., Simpson, J. A., Kashy, D. A., & Rholes, W. S. (2001). Attachment orientations, dependence, and behavior in a stressful situation: An application of the actor-partner interdependence model. *Journal of Social and Personal Relationships, 18*, 821-843.
- Cappuccio, M. L. (2015). Introduction: When embodied cognition and sport psychology team-up. *Phenomenology and the Cognitive Sciences, 14*, 213-225. doi: 10.1007/s11097-015-9415-1
- Carr, S. (2009a). Implications of attachment theory for sport and physical activity research: conceptual links with achievement goal and peer-relationship models. *International Review of Sport and Exercise Psychology, 2*, 95-115.
- Carr, S. (2009b). Adolescent–parent attachment characteristics and quality of youth sport friendship. *Psychology of Sport and Exercise, 10*, 653-661.
doi:10.1016/j.psychsport.2009.04.001
- Carr, S (2012a). *Attachment, sport, exercise, and wellness*. New York, NY: Routledge.
- Carr, S. (2012b). Relationships and sport performance. Murphy, S. (Ed.). (2012). *The Oxford handbook of sport and performance psychology*. Oxford University Press.
doi:10.1093/oxfordhb/9780199731763.013.0021

- Cassidy, J. (1999). The nature of a child's ties. In J. Cassidy and J. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 3-20). New York: Guilford Press.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*, 297-334.
- Davis, L., & Jowett, S. (2010). Investigating the interpersonal dynamics between coaches and athletes based on fundamental principles of attachment. *Journal of Clinical Sport Psychology*, *4*, 112-132.
- Davis, L., & Jowett, S. (2013). Attachment styles within the coach-athlete dyad: preliminary investigation and assessment development. *Journal of Clinical Sport Psychology*, *7*, 120-145.
- Davis, L., & Jowett, S. (2014). Coach-athlete attachment and the quality of the coach-athlete relationship: implications for athlete's well-being. *Journal of Sports Sciences*, *32*, 1454-1464.
- Dewitte, M., Koster, E. H., De Houwer, J., & Buysse, A. (2007). Attentive processing of threat and adult attachment: A dot-probe study. *Behaviour Research and Therapy*, *45*, 1307-1317.
- Dizdari, H., Bunke, S., & Psouni, E. (2013). *Attachment, competitive anxiety and self-confidence among competitive swimmers*. Retrieved from Swedish Center for Aquatic Research. <http://www.sweaquatics.com/attachment-competitive-anxiety-and-self-confidence-among-competitive-swimmer/>
- Doumas, D. M., Turrisi, R., & Wright, D. A. (2006). Risk factors for heavy drinking in college freshmen: Athletic status and adult attachment. *The Sport Psychologist*, *20*, 419-434.

- Ein-Dor, T., Mikulincer, M., Doron, G., & Shaver, P. R. (2010). The attachment paradox: How can so many of us (the insecure ones) have no adaptive advantages? *Perspectives on Psychological Science*, *5*, 123-141.
- Ein-Dor, T., & Hirschberger, G. (2016). Rethinking attachment theory: From a theory of relationships to a theory of individual and group survival. *Current Directions in Psychological Science*, *25*, 223-227.
- Ein-Dor, T., Reizer, A., Shaver, P. R., & Dotan, E. (2012). Standoffish perhaps, but successful as well: Evidence that avoidant attachment can be beneficial in professional tennis and computer science. *Journal of Personality*, *80*, 749-768.
- Eisenberger, N. I., Lieberman, M. D., & Williams, K. D. (2003). Does rejection hurt? An fMRI study of social exclusion. *Science*, *302*, 290-292.
- Elliot, A. J., & Reis, H. T. (2003). Attachment and exploration in adulthood. *Journal of Personality and Social Psychology*, *85*, 317-331.
- Eysenck, M. W., Derakshan, N., Santos, R., & Calvo, M. G. (2007). Anxiety and cognitive performance: attentional control theory. *Emotion*, *7*, 336-353.
doi.org/10.1037/1528-3542.7.2.336
- Fedderm Donbaek, D., & Elklit, A. (2014). A validation of the experiences in close relationships-relationship structures scale (ecr-rs) in adolescents. *Attachment & Human Development*, *16*, 58-76.
- Felton, L., & Jowett, S. (2013). Attachment and well-being: The mediating effects of psychological needs satisfaction within the coach-athlete and parent-athlete relational contexts. *Psychology of Sport and Exercise*, *14*, 57-65.

- Felton, L., & Jowett, S. (2015). On understanding the role of need thwarting in the association between athlete attachment and well/ill-being. *Scandinavian Journal of Medicine & Science in Sports, 25*, 289-298.
- Felton, L., & Jowett, S. (2017). Self-determination theory perspective on attachment, need satisfaction, and well-being in a sample of athletes: A longitudinal study. *Journal of Clinical Sport Psychology, 11*, 304-323.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Sage.
- Fonagy, P., & Target, M. (2002). Early intervention and the development of self-regulation. *Psychoanalytic Inquiry, 22*, 307-335.
- Forrest, K. A. (2008). Attachment and attention in sport. *Journal of Clinical Sport Psychology, 2*, 242-257.
- Fraley, R. C., Niedenthal, P. M., Marks, M., Brumbaugh, C., & Vicary, A. (2006). Adult attachment and the perception of emotional expressions: Probing the hyperactivating strategies underlying anxious attachment. *Journal of Personality, 74*, 1163-1190.
- Fraley, R. C., Heffernan, M. E., Vicary, A. M., & Brumbaugh, C. C. (2011). The experiences in close relationships—Relationship structures questionnaire: A method for assessing attachment orientations across relationships. *Psychological Assessment, 23*, 615-625.
- Fraley, R. C., Hudson, N. W., Heffernan, M. E., & Segal, N. (2015). Are adult attachment styles categorical or dimensional? A taxometric analysis of general and relationship-specific attachment orientations. *Journal of Personality and Social Psychology, 109*, 354-368.

- Fayant, M. P., Sigall, H., Lemonnier, A., Retsin, E., & Alexopoulos, T. (2017). On the limitations of manipulation checks: An obstacle toward cumulative science. *International Review of Social Psychology*, 30, Retrieved from: <https://www.rips-irsp.com/article/10.5334/irsp.102/>
- Geukes, K., Mesagno, C., Hanrahan, S. J., & Kellmann, M. (2013). Activation of self-focus and self-presentation traits under private, mixed, and public pressure. *Journal of Sport and Exercise Psychology*, 35, 50-59.
- Geukes, K., Mesagno, C., Hanrahan, S. J., & Kellmann, M. (2013). Performing under pressure in private: Activation of self-focus traits. *International Journal of Sport and Exercise Psychology*, 11, 11-23.
- Gilbert, P., McEwan, K., Bellew, R., Mills, A., & Gale, C. (2009). The dark side of competition: How competitive behaviour and striving to avoid inferiority are linked to depression, anxiety, stress and self-harm. *Psychology and Psychotherapy: Theory, Research and Practice*, 82, 123-136.
- Gillath, O., Giesbrecht, B., & Shaver, P. R. (2009a). Attachment, attention, and cognitive control: Attachment style and performance on general attention tasks. *Journal of Experimental Social Psychology*, 45, 647-654.
- Gillath, O., Hart, J., Nofle, E. E., & Stockdale, G. D. (2009b). Development and validation of a state adult attachment measure (SAAM). *Journal of Research in Personality*, 43, 362-373.
- Gillath, O., Sesko, A. K., Shaver, P. R., & Chun, D. S. (2010). Attachment, authenticity, and honesty: Dispositional and experimentally induced security can reduce self- and other-deception. *Journal of Personality and Social Psychology*, 98, 841-855.

- Griffin, D. W., & Bartholomew, K. (1994). The metaphysics of measurement: The case of adult attachment. In K. Bartholomew & D. Perlman (Eds.), *Advances in personal relationships: Attachment processes in adulthood* (Vol.5, pp. 17-52). London: Jessica Kingsley.
- Gucciardi, D. F., & Dimmock, J. A. (2008). Choking under pressure in sensorimotor skills: Conscious processing or depleted attentional resources? *Psychology of Sport and Exercise, 9*, 45-59.
- Gucciardi, D. F., & Gordon, S. (2011). *Mental toughness in sport: Developments in theory and Research*. New York, NY: Routledge.
- Gucciardi, D. F., Gordon, S., Dimmock, J. A., & Mallett, C. J. (2009). Understanding the coach's role in the development of mental toughness: Perspectives of elite Australian football coaches. *Journal of Sports Sciences, 27*, 1483-1496.
- Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology, 52*, 511-524.
- Hill, D. M., Hanton, S., Matthews, N., & Fleming, S. (2011). Alleviation of choking under 10 pressure in elite golf: An action research study. *The Sport Psychologist, 25*, 465-488.
- Hill, D. M., Hanton, S., Matthews, N., & Fleming, S. (2010). Choking in sport: A review. *International Review of Sport and Exercise Psychology, 3*, 24-39.
- Hesse, E., & Main, M. (2000). Disorganized infant, child, and adult attachment: Collapse in behavioral and attentional strategies. *Journal of the American Psychoanalytic Association, 48*, 1097-1127.
- Hudson, N. W., Fraley, R. C., Chopik, W. J., & Heffernan, M. E. (2015). Not all attachment relationships develop alike: Normative cross-sectional age trajectories

- in attachment to romantic partners, best friends, and parents. *Journal of Research in Personality*, 59, 44-55.
- Jin, L., & Wang, C. D. (2018). International students' attachment and psychological well-being: the mediation role of mental toughness. *Counselling Psychology Quarterly*, 31, 59-78.
- Kaiseler, M., Polman, R., & Nicholls, A. (2009). Mental toughness, stress, stress appraisal, coping and coping effectiveness in sport. *Personality and Individual Differences*, 47, 728-733.
- Kim, Y. (2006). Gender, attachment, and relationship duration on cardiovascular reactivity to stress in a laboratory study of dating couples. *Personal Relationships*, 13, 103-114.
- Kline, P. (1999). *The handbook of psychological testing* (2nd ed.). London: Routledge.
- La Guardia, J. G., Ryan, R. M., Couchman, C. E., & Deci, E. L. (2000). Within-person variation in security of attachment: a self-determination theory perspective on attachment, need fulfillment, and well-being. *Journal of personality and social psychology*, 79, 367-.
- Larose, S., Bernier, A., & Tarabulsy, G. M. (2005). Attachment state of mind, learning dispositions, and academic performance during the college transition. *Developmental Psychology*, 41, 281-289.
- Lavy, S., Bareli, Y., & Ein-Dor, T. (2015). The effects of attachment heterogeneity and team cohesion on team functioning. *Small Group Research*, 46, 27-49.
- Levine, A., & Heller, S. F. (2010). *Attached: The new science of adult attachment and how it can help you find-and keep-love*. New York, NY: Penguin Group.
- Lewin, K. (1936). *Principles of topological psychology*. New York: McGraw-Hill.

- Li, R., Bunke, S., & Psouni, E. (2016). Attachment relationships and physical activity in adolescents: The mediation role of physical self-concept. *Psychology of Sport and Exercise, 22*, 160-169.
- Lopez, F. G., & Gormley, B. (2002). Stability and change in adult attachment style over the first-year college transition: Relations to self-confidence, coping, and distress patterns. *Journal of Counseling Psychology, 49*, 355-364.
- Main, M. (2000). The organized categories of infant, child, and adult attachment: Flexible vs. inflexible attention under attachment-related stress. *Journal of the American Psychoanalytic Association, 48*, 1055-1096.
- Marini, M. & Sullivan, P. (2017). Examining the influence of different levels of pressure on the performance of a volleyball serving task. *Journal of Sport & Exercise Psychology, 39*, S283.
- Mattarella-Micke, A., Mateo, J., Kozak, M. N., Foster, K., & Beilock, S. L. (2011). Choke or thrive? The relation between salivary cortisol and math performance depends on individual differences in working memory and math-anxiety. *Emotion, 11*, 1000-1005. doi:10.1037/10023224
- Maunder, R. G., Lancee, W. J., Nolan, R. P., Hunter, J. J., & Tannenbaum, D. W. (2006). The relationship of attachment insecurity to subjective stress and autonomic function during standardized acute stress in healthy adults. *Journal of Psychosomatic Research, 60*, 283-290.
- McWilliams, L. A., & Asmundson, G. J. (2007). The relationship of adult attachment dimensions to pain-related fear, hypervigilance, and catastrophizing. *Pain, 127*, 27-34.

- Meredith, P., Ownsworth, T., & Strong, J. (2008). A review of the evidence linking adult attachment theory and chronic pain: Presenting a conceptual model. *Clinical Psychology Review, 28*, 407-429.
- Meredith, P. J., Strong, J., & Feeney, J. A. (2006). The relationship of adult attachment to emotion, catastrophizing, control, threshold and tolerance, in experimentally-induced pain. *Pain, 120*, 44-52.
- Mesagno, C., Geukes, K., Larkin, P. (2015). Choking under pressure: a review of current debates, literature and interventions. In S. D. Mellalieu & S. Hanton (Eds.), *Contemporary Advances in Sport Psychology: A review* (pp.148-174). New York, NY: Routledge.
- Mesagno, C., Harvey, J. T., & Janelle, C. M. (2012). Choking under pressure: The role of fear of negative evaluation. *Psychology of Sport and Exercise, 13*, 60-68.
- Mesagno, C., Marchant, D., & Morris, T. (2009). Alleviating choking: The sounds of distraction. *Journal of Applied Sport Psychology, 21*, 131-147.
- Mikulincer, M. (1995). Attachment style and the mental representation of the self. *Journal of Personality and Social Psychology, 69*, 1203-1215.
- Mikulincer, M., & Florian, V. (1995). Appraisal of and coping with a real-life stressful situation: The contribution of attachment styles. *Personality and Social Psychology Bulletin, 21*, 406-414.
- Mikulincer, M., & Florian, V. (1998). The relationship between adult attachment styles and emotional and cognitive reactions to stressful events. In J.A. Simpson & W.S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 143-65). New York: Guilford Press

- Mikulincer, M., Birnbaum, G., Woddis, D., & Nachmias, O. (2000). Stress and accessibility of proximity-related thoughts: exploring the normative and intraindividual components of attachment theory. *Journal of Personality and Social Psychology, 78*, 509-523.
- Mikulincer, M., Florian, V., & Weller, A. (1993). Attachment styles, coping strategies, and posttraumatic psychological distress: the impact of the Gulf War in Israel. *Journal of Personality and Social Psychology, 64*, 817-826.
- Mikulincer, M., Gillath, O., & Shaver, P. R. (2002). Activation of the attachment system in adulthood: Threat-related primes increase the accessibility of mental representations of attachment figures. *Journal of Personality and Social Psychology, 83*, 881-895.
- Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics, and change*. New York, NY: Guilford Press.
- Mikulincer, M., & Shaver, P. R. (2016). *Attachment in adulthood: Structure, dynamics, and change* (2nd ed). New York, NY: Guilford Press.
- Mikulincer, M., Dolev, T., & Shaver, P. R. (2004). Attachment-related strategies during thought suppression: Ironic rebounds and vulnerable self-representations. *Journal of Personality and Social Psychology, 87*, 940-956. doi:10.1037/0022-3514.87.6.940
- Mikulincer, M., & Shaver, P. R. (2003). The attachment behavioral system in adulthood: Activation, psychodynamics, and interpersonal processes. *Advances in Experimental Social Psychology, 35*, 53-152.

- Mikulincer, M., & Shaver, P. R. (2017). Augmenting the sense of attachment security in group contexts: The effects of a responsive leader and a cohesive group. *International Journal of Group Psychotherapy, 67*, 161-175.
- Rice, S. M., Purcell, R., De Silva, S., Mawren, D., McGorry, P. D., & Parker, A. G. (2016). The mental health of elite athletes: a narrative systematic review. *Sports medicine, 46*, 1333-1353.
- Roberts, R., & Woodman, T. (2015). Contemporary personality perspectives in sport psychology: a review of current debates, literature and interventions. In S. D. Mellalieu & S. Hanton (Eds.), *Contemporary Advances in Sport Psychology: A review* (pp.148-174). New York, NY: Routledge.
- Rom, E., & Mikulincer, M. (2003). Attachment theory and group processes: The association between attachment style and group-related representations, goals, memories, and functioning. *Journal of personality and Social Psychology, 84*, 1220-1235.
- Ronen, S., & Mikulincer, M. (2009). Attachment orientations and job burnout: The mediating roles of team cohesion and organizational fairness. *Journal of Social and Personal Relationships, 26*, 549-567.
- Rosenthal, H. E., Walsh, J., Crisp, R. J., Farrow, C. V., Waugh, M. J., Blissett, J., & Millings, A. (2012). Attachment anxiety and friendship group identification under attachment threat: The moderating role of priming support network expectations. *Personality and Individual Differences, 53*, 562-567.
- Schore, A. N. (2001). Effects of a secure attachment relationship on right brain development, affect regulation, and infant mental health. *Infant Mental Health Journal, 22*, 7-66.

- Sigall, H. and Mills, J. (1998). Measures of independent variables and mediators are useful in social psychology experiments: But are they necessary? *Personality and Social Psychology Review*, 2, 218–226, doi.org/10.1207/s15327957pspr0203_5
- Simmons, B. L., Gooty, J., Nelson, D. L., & Little, L. M. (2009). Secure attachment: Implications for hope, trust, burnout, and performance. *Journal of Organizational Behavior*, 30, 233-247.
- Sroufe, L. A., & Waters, E. (1977). Attachment as an organizational construct. *Child Development*, 48, 1184-1199.
- Sukys, S., Lisinskiene, A., & Tilindiene, I. (2015). Adolescents' participation in sport activities and attachment to parents and peers. *Social Behavior and Personality*, 43, 1507-1517.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Multivariate analysis of variance and covariance*. Using multivariate statistics, 3, 402-407.
- Tenenbaum, G., Basevitch, I., Gershgoren, L., & Filho, E. (2013). Emotions–decision-making in sport: Theoretical conceptualization and experimental evidence. *International Journal of Sport and Exercise Psychology*, 11(2), 151-168.
- Thomas, O., Hanton, S., & Jones, G. (2002). An alternative approach to short-form self-report assessment of competitive anxiety: a research note. *International Journal of Sport Psychology*, 33, 325-336.
- Tiryaki, M. Ş., & Çepikkurt, F. (2007). Relations of attachment styles and group cohesion in premier league female volleyball players. *Perceptual and Motor Skills*, 104, 69-78.

- Van Emmichoven, I. A. Z., Van Ijzendoorn, M. H., De Ruiter, C., & Brosschot, J. F. (2003). Selective processing of threatening information: Effects of attachment representation and anxiety disorder on attention and memory. *Development and Psychopathology, 15*, 219-237. doi:10.1017.S0954579403000129
- Vickers, J. N., & Williams, A. M. (2007). Performing under pressure: The effects of physiological arousal, cognitive anxiety, and gaze control in biathlon. *Journal of Motor Behavior, 39*, 381-394.
- Wang, J., Marchant, D., & Morris, T. (2004a). Coping style and susceptibility to choking. *Journal of Sport Behavior, 27*, 75-92.
- Wang, J., Marchant, D., Morris, T., & Gibbs, P. (2004). Self-consciousness and trait anxiety as predictors of choking in sport. *Journal of Science and Medicine in Sport, 7*, 174-185.
- Weiss, M. R., & Smith, A. L. (1999). Quality of youth sport friendships: Measurement development and validation. *Journal of Sport and Exercise Psychology, 21*, 145-166.
- West, M., Rose, M. S., Spreng, S., Sheldon-Keller, A., & Adam, K. (1998). Adolescent attachment questionnaire: A brief assessment of attachment in adolescence. *Journal of Youth and Adolescence, 27*, 661-673.
- Wilson, M., R., Vine, S. J. (2009). Performing under pressure: Attentional control and the suppression of vision in basketball free-throw shooting. In C. H. Chang (Eds.), *Handbook of Sports Psychology* (277-296). New York: Nova Science Publishers, Inc.

- Wilson, M. R., Vine, S. J., & Wood, G. (2009). The influence of anxiety on visual attentional control in basketball free throw shooting. *Journal of Sport and Exercise Psychology, 31*, 152-168.
- Wine, J. (1971). Test anxiety and direction of attention. *Psychological bulletin, 76*, 92-104. doi:10.1037/h0031332
- Yu, R. (2015). Choking under pressure: the neuropsychological mechanisms of incentive-induced performance decrements. *Frontiers in Behavioral Neuroscience, 9*, 1-8. doi:10.3389/fnbeh.2015.00019

Appendix A: Letter of Invitation

Letter of Invitation**Title of Study: Individual Differences, Shooting Style and Accuracy in Competitive Basketball Players**

Principal Investigator: Dr. Philip Sullivan, Kinesiology, Brock University

Student Principal Investigator: Mishka Blacker, Kinesiology, Brock University

We, Mishka Blacker and Dr. Philip Sullivan, researchers at Brock University, invite your team to participate in a sport psychology research project. The purpose of the study is to investigate individual differences that are related basketball players' performance. Specifically, we are looking at certain individual differences that may influence players' free throw shooting style and accuracy.

Participants will be asked to complete 2 short questionnaires, and shoot 20 free throws on two separate days in their home gym. Participants are all guaranteed a minimum of \$5.00 compensation for their time and participation. In total, participation take will approximately 25 minutes (10-15 minutes for questionnaires; 5 minutes x 2 for free throw attempts).

Participation in this study has potential to benefit research on sport performance as well as the scientific community.

If you have any questions, please feel free to contact Mishka Blacker or Dr. Philip Sullivan using the contact information below.

This study has been reviewed and received ethics clearance through Brock University's Research Ethics Board #16-248.

Thank you,

Dr. Philip Sullivan, Principal Investigator
Department of Kinesiology, Brock University
905-688-5550, ext. 4787;
psullivan@brocku.ca

Mishka Blacker, Principal Student Researcher
Department of Kinesiology, Brock University
647-444-0350; mb15at@brock.ca

Informed Consent Form

Date: October 2017

Project Title: Individual Differences, Shooting Style and Accuracy in Competitive Basketball Players

Principal Investigator: Dr. Philip Sullivan
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University
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Student Principal Investigator: Mishka
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INVITATION

You are invited to participate in a study that involves research. The purpose of this study is to investigate the individual differences in basketball players' free throw shooting style.

WHAT'S INVOLVED

The total participation time will be about 25 minutes. You will be compensated a minimum of \$5.00 for your participation. As a participant, you will be asked to complete 2 short questionnaires in a group setting; one on your background (e.g. age, basketball experience) and another on your experiences in certain relationships. You will also complete 20 free throws on two separate days; during one of those days a video camera will be placed at the side of the court and will record your shooting style as part of an ongoing research for an ongoing project by the Coaching Association of Canada and may be asked for their recorded performance to be part of a new technical skill and execution training module.

POTENTIAL BENEFITS AND RISKS

Participants will benefit by contributing to research on sport performance and the scientific community and society. It is possible that you may feel worried or embarrassed while performing the free throws, but it is expected that these feelings would be less than what you might experience while playing in a public basketball game.

CONFIDENTIALITY

All the information you provide is **confidential**. Our interest is in the average results of the group, not individual responses. Any personal information (i.e., name) will be stored separately and securely from data collected. All information will be kept in a secure, locked office at Brock University. Once data has been collected and digitized, all personal information and hard copies of questionnaires and free throw information will be confidentially destroyed. Digital data will be kept for 6 months in a password-protected computer, after which time all data will be deleted. Access to the information collected this study will be restricted to Dr. Philip Sullivan and Mishka Blacker.

VOLUNTARY PARTICIPATION

Participation in this study is completely voluntary. You may decline to answer any questions or participate in any component of the study. If you decide at anytime to withdraw your participation from the study, you will still be debriefed and compensated in the amount of \$5.00.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available as of January 2018. If you would like feedback on the results of the study please contact Dr. Philip Sullivan at psullivan@brocku.ca or Mishka Blacker at mb15at@brocku.ca

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact Dr. Philip Sullivan or Mishka Blacker using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University #16-248. If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

Thank you for your assistance in this project.

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Informed-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: _____

Signature: _____ Date: _____

Appendix C: Demographics Form

Please complete the following questions about yourself and your basketball background. If you prefer not to answer, you may leave the space blank.

1. Age: _____
2. Gender: _____
3. On average, how many **days** do you train on court per week? _____
4. On average, how many **hours** do you practice on the days indicated above?

5. How many years have you played on your **current** high school team? _____
6. Are you currently a member of another competitive basketball team? _____
7. Are you currently a starter on your team? _____
8. What is your free throw percentage? _____% (If you do not know your free throw percentage, please estimate what it would be).

Appendix D:

Experiences in Close Relationships-Relationship Structures Questionnaire (Fraley 2011)

This questionnaire is designed to assess the way you mentally represent certain people in your life. Please indicate the extent to which you agree or disagree with each of the 9 statements below by circling a number for each statement. If you prefer not to answer, leave your answer blank.

Please answer the following questions about your mother or a mother-like figure

It helps to turn to this person in times of need.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I usually discuss my problems and concerns with this person.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I talk things over with this person.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I find it easy to depend on this person.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I don't feel comfortable opening up to this person.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I prefer not to show this person how I feel deep down.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I often worry that this person doesn't really care for me.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I'm afraid that this person may abandon me.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I worry that this person won't care about me as much as I care about him or her.

strongly disagree 1 2 3 4 5 6 7 strongly agree

This questionnaire is designed to assess the way you mentally represent certain people in your life. Please indicate the extent to which you agree or disagree with each of the 9 statements below by circling a number for each statement. If you prefer not to answer, leave your answer blank.

Please answer the following 9 questions about your father or a father-like figure

It helps to turn to this person in times of need.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I usually discuss my problems and concerns with this person.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I talk things over with this person.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I find it easy to depend on this person.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I don't feel comfortable opening up to this person.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I prefer not to show this person how I feel deep down.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I often worry that this person doesn't really care for me.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I'm afraid that this person may abandon me.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I worry that this person won't care about me as much as I care about him or her.

strongly disagree 1 2 3 4 5 6 7 strongly agree

This questionnaire is designed to assess the way you mentally represent certain people in your life. Please indicate the extent to which you agree or disagree with each of the 9 statements below by circling a number for each statement. If you prefer not to answer, leave your answer blank.

Please answer the following 9 questions about your best friend on your team (closest teammate).

It helps to turn to this person in times of need.
strongly disagree 1 2 3 4 5 6 7 strongly agree

I usually discuss my problems and concerns with this person.
strongly disagree 1 2 3 4 5 6 7 strongly agree

I talk things over with this person.
strongly disagree 1 2 3 4 5 6 7 strongly agree

I find it easy to depend on this person.
strongly disagree 1 2 3 4 5 6 7 strongly agree

I don't feel comfortable opening up to this person.
strongly disagree 1 2 3 4 5 6 7 strongly agree

I prefer not to show this person how I feel deep down.
strongly disagree 1 2 3 4 5 6 7 strongly agree

I often worry that this person doesn't really care for me.
strongly disagree 1 2 3 4 5 6 7 strongly agree

I'm afraid that this person may abandon me.
strongly disagree 1 2 3 4 5 6 7 strongly agree

I worry that this person won't care about me as much as I care about him or her.
strongly disagree 1 2 3 4 5 6 7 strongly agree

Appendix E: Mental Readiness Form – Likert (Krane, 1994)

Please circle, as appropriate, the figure that best represents **your current state of anxiety**. If you prefer not to answer, leave it blank.

1. My thoughts are:

1	2	3	4	5	6	7	8	9	10	11
---	---	---	---	---	---	---	---	---	----	----

Not Worried
Worried

2. My body feels:

1	2	3	4	5	6	7	8	9	10	11
---	---	---	---	---	---	---	---	---	----	----

Not Tense
Tense

3. I am feeling:

1	2	3	4	5	6	7	8	9	10	11
---	---	---	---	---	---	---	---	---	----	----

Not Confident
Confident

Appendix F: Participant Debriefing Form

**The Influence of Attachment Style on Performance Under Pressure
Debriefing Form**

Thank you for your participation.

Athletic Performance Under Pressure

The main aim of this research design was to create scenarios where you would experience different amounts of performance pressure. To do this, we told you that you were being video recorded for an ongoing project by the Coaching Association of Canada on shooting style. However, this was not true, and this was an attempt to mislead you so that you did not know the true purpose of the study. **You were not being video recorded, nor was this project in any way associated with the CAC.** We apologize for misleading you. Our reasoning for this was that previous research has shown that pressure can effect athletic performance, and that athletes can often feel greater pressure to perform when they are not prepared to perform while an expert audience is observing them (Geukes et al., 2013), as well as when rewards, especially financial rewards, can be gained (Wang et al., 2004). We used both of these manipulations to try and create feelings of pressure during your second throwing task.

Attachment Style

Recently, research has shown that people with certain relationship histories and relationship styles, may respond differently to stressful or threatening situations. But no research has looked at whether these stressful situations extend to the pressure experienced in sport, and if this has an impact on sport performance in athletes. This project aims to address this question.

More information on attachment theory and performance under pressure can be found here:

Carr, S. (2012). *Attachment in sport, exercise, and wellness*. London, UK: Routledge.

Wang, J., Marchant, D., & Morris, T. (2004). Coping style and susceptibility to Choking. *Journal of Sport Behavior*, 27, 75-92.

If you would like more information on this project, please feel free to contact the Dr. Philip Sullivan at psullivan@brocku.ca or Mishka Blacker at mb15at@brocku.ca

If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca. If you would like to speak to a counsellor about your experience as a research participant in this study, you may contact Brock University's Counselling Services at Call 905-688-5550 extension 4750.

Thank you.