



Examining the association between adult attachment style and cortisol responses to acute stress

Tara Kidd^{*}, Mark Hamer, Andrew Steptoe

Department of Epidemiology and Public Health, University College London, London, United Kingdom

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Summary The quality of social relationships may contribute to variations in biological stress responses, thereby affecting health risk. The association between an important indicator of social relationships, adult attachment style, and cortisol has been relatively unexplored. The present study examined adult romantic attachment style and cortisol responses to acute laboratory stress. Salivary cortisol was measured in response to two behavioural tasks, a colour/word interference task and mirror tracing task, in 498 healthy men and women from the Heart Scan study, a subsample of the Whitehall II cohort. Participants were classified as secure, fearful, preoccupied or dismissive on the basis of responses to the Relationship Questionnaire. Cortisol output was lowest in the fearful group, followed by the preoccupied group, with both secure and dismissive groups having higher levels. The results from this study tentatively support the proposition that attachment style is a factor in determining the manifestation of HPA dysregulation.

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1. Introduction

Attachment theory proposes that a biologically based system of behaviours regulates proximity between an infant and caregiver with the goal of increasing the infant's survival in the face of external threats (Bowlby, 1969). These interactions between infant and care-giver are internalised forming enduring cognitive schemas, or "internal working models", of expectations of care that remain into adulthood (Bowlby, 1969; Hazan and Shaver, 1987; Bartholomew and

Horowitz, 1991). Expectations and responses to interpersonal situations learned in these early relationships provide a template for relatively stable and enduring patterns of interpersonal behaviour which are known as the adult attachment style (Ainsworth et al., 1978; Hazan and Shaver, 1987). It is believed that the adult attachment style remains linked to the psychological and biological systems that regulate threat (stressor) appraisal, response and recovery (Bowlby, 1969). To date the main focus of adult attachment research has been on subjective accounts of distress, particularly symptom reporting (Ciechanowski et al., 2002a,b; Kidd and Sheffield, 2005; Wearden et al., 2005; Armitage and Harris, 2006). Little is known about physiological responses to the activation of the attachment system. This paper aims to extend previous work by examining adult attachment using the four style classification model and cortisol responses to acute stress in healthy older men and women.

^{*} Corresponding author at: Department of Epidemiology and Public Health, University College London, 1-19 Torrington Place, London WC1E 6BT, UK. Tel.: +44 02076791846.

E-mail address: T.Kidd@ucl.ac.uk (T. Kidd).

There are two traditions for measuring adult attachment, the first examines retrospective accounts of parent–child relationships and is assessed using semi structured interview developed by Main and colleagues (1985). In the second, the peer/romantic partner tradition, authors have developed questionnaires to measure how adults with different attachment histories perceive and behave in close relationships (Hazan and Shaver, 1987). These self report measures of adult attachment assign individuals to categories of attachment style or measure the degree to which various dimensions of attachment style are present. Dimensional measures of attachment focus on attachment anxiety (expectation of separation, abandonment, or insufficient love; a preoccupation with the availability and responsiveness of others; and hyper-activation of attachment behaviour) and avoidance (devaluation of the importance of close relationships, avoidance of intimacy and dependency, self reliance, and relative deactivation of attachment behaviour) (Brennan et al., 1998). Although continuous methods of assessing attachment style have been shown to provide a more accurate picture than that available using the four discrete categories (Brennan et al., 1998), categories continue to be used in contemporary research for their ease of administration and interpretation (Maunder and Hunter, 2009), particularly so in large scale studies in which attachment is measured along with many other variables. This is the case in the Whitehall II prospective epidemiological study from which these data were drawn (Bartley et al., 2007). Moreover there is no consensus as to whether attachment phenomena are inherently categorical or dimensional (Ravitz et al., 2010).

Bartholomew and Horowitz (1991) measure reconciles categorical and dimensional models by defining categories that correspond to a combination of extreme positions on the dimensions of attachment anxiety and avoidance. They developed a two-dimensional model comprising of view of self and view of others. Scores on these dimensions produce four possible attachment prototypes. Those classed as secure (low anxiety, low avoidance) hold a positive view of self and others because of the consistent responsive care they received. They are comfortable relying on others, and are easily comforted. Preoccupied individuals (high anxiety, low avoidance) hold a negative view of themselves, but a positive view of others due to inconsistent caregiving. This style is characterised by emotional dependency on others, negative affect, being hyper-vigilant to any potential threats, and having low self esteem. Dismissive persons (low anxiety, high avoidance) have a positive view of self, where they view themselves as resilient and not needing others, but a negative view of others due to early unresponsive care. Although they are uncomfortable being close to others, they have a positive view of themselves. This strategy leads to the denial of attachment needs, avoidance of closeness, intimacy, dependence in close relationships, and self reliance and independence. Finally, fearful individuals (high anxiety, high avoidance) have a negative view of both themselves and others. Akin to preoccupied styles they seek social contact, but in this case are inhibited by fear of rejection. This leads to a behaviour style of approach and avoidance in interpersonal interactions in adult life. In common with preoccupied styles they experience high levels of negative affect and poor self esteem.

Bowlby (1969) believed that adult attachment style remains linked to the psychological and biological systems that regulate threat appraisal, stress response, and recovery from stress. Research has shown that there are differences between attachment styles on threat appraisal during both attachment and non-attachment related stressors (Mikulincer and Florian, 1998; Schmidt et al., 2002). Individuals high in attachment anxiety are hyper-reactive to threats, tend to report greater levels of perceived stress, and also are much more likely to ruminate over the event (Shaver and Mikulincer, 2007). Those high in attachment avoidance are more likely to employ defensive regulation mechanisms, such as repression, to allow them to control unpleasant emotionally stressful situations (Shaver and Mikulincer, 2007). Although past work suggests that attachment insecurity could be an important factor in regulating the perception of threat, less is known regarding any association between attachment style and biological response to stress.

Stressful situations are thought to activate the attachment system (Bowlby, 1969; Mikulincer et al., 2003), and physiological systems are an important mechanism for the expression of stress responses. It has been argued that the hypothalamic–pituitary–adrenal (HPA) axis will be particularly sensitive to attachment processes because it specifically responds in situations that evoke social-evaluative threat (Blascovich and Tomaka, 1996; Dickerson and Kemeny, 2004; Denson et al., 2009), is sensitive to interpersonal situations (Diamond, 2001; Kirschbaum et al., 1995), and shows individual variation in response (Gerra et al., 2001). Stimulation of the HPA axis leads to the release of adrenocorticotropin hormone (ACTH) by the anterior pituitary, which results in the adrenal cortex releasing cortisol into the bloodstream. Although activation of these systems in response to stress is functional, repeated activation of the stress system can ultimately compromise functioning (Taylor, 2010).

There is an extensive literature that supports the existence of a relationship between early care-giving experiences and dysregulation of the HPA axis in animals and humans, whereby adverse early life experience stimulates upregulation or down-regulation of adult cortisol stress responses resulting in dysregulation of stress responsivity (Heim et al., 2000; Luecken and Lemery, 2004; Carpenter et al., 2009; Lupien et al., 2009). Much of the research to date has examined these processes in populations that have experienced trauma or abuse (Repetti et al., 2002; Taylor, 2010). However there is mounting evidence that lower level stressful early life experiences can also compromise the HPA axis pathways such as non-nurturant behaviour, neglect, non-responsive parenting, and maternal withdrawal (Taylor, 2010). In a review Chorpita and Barlow (1998) reported that families characterised by low levels of warmth, and high/low restrictions, and controlling parenting had children with a hyper-reactive cortisol response to stress. It is widely believed that over time this chronic response gives way to hypocortisolism as the HPA axis loses its resilience (McEwen, 1998). Thus, the effects of early environment on HPA stress response may occur across a spectrum of early environment quality and involve multiple parameters of the HPA axis, as well as alterations in functioning over time. Not surprisingly, attachment insecurity has been associated with adverse early life experience (Quirin et al., 2008). It has been suggested

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