IMPLICIT PROCESSES IN
ADULT ATTACHMENT

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CONTENTS

GENERAL INTRODUCTION

"People do not enter relationships as tabula rasa, they bring with them a history of social experiences and a unique set of expectations, beliefs, goals, and actions that guide how they interact with others and how they construe their social world" (Collins, Guichard, Ford, & Feeney, 2004, p. 196).

Humans are social beings entering a variety of interactions that naturally evolve into all kinds of relationships, ranging from superficial connections to interdependent close relationships. We are born into some relationships, others we develop later in life. As we mature, we spend an increasingly amount of time reflecting on our relational experiences and devote much energy to creating and maintaining successful personal relationships, which has become one of the most important aspirations of the modern individual. Being a core element of daily interpersonal life, the study of close relationships has sparked the interest of many researchers. When studying close relationships, a range of questions may arise. What makes some people more special to us than others? Why are maladaptive behavioural patterns learned from the past often perpetuated in present-day encounters with new people? Why do some people easily get distressed by minor relationship events, while others remain coldly unaffected and seem emotionally aloof? How come that some people are so keenly focused on negative affective experiences that they do not notice the loving and caring signals sent by their relationship partner? Why do some people feel uncomfortable with closeness, whereas others crave intimacy and never seem to get enough? How come that some relationship-experiences make us feel vulnerable and worthless or make us doubt about the other's love and affection?

During the past decades, relationship researchers have devoted considerable attention to understanding individual differences in the way people process information and behave in their social environments. These efforts have resulted in a growing body of work that includes detailed theories about the role of cognitive, affective, and motivational variables in relationship processes. Although a variety of factors have been identified as contributing to individual differences in relationship functioning, many researchers have hypothesized that such differences stem largely from an individual's history of relationship experiences. One theoretical perspective that has been highly influential in

explaining the effects of close relationships on the processing of social information and social behaviour is attachment theory (Bowlby, 1969, 1982).

According to this theory, past relationship experiences translate into mental representations that shape cognitive, emotional, and behavioural responses in later relationships. Such attachment 'schemas' are assumed to influence whether and how individuals selectively attend to emotional and attachment figure-related information, how they behave towards their attachment figure, and how they think about themselves and others. Traditionally, these attachment phenomena have been studied by directly asking people about their thoughts, feelings, and behaviour in close relationships. Yet, recent theories and evidence indicate that conscious processes and explicit beliefs may reflect only a small part of relationship functioning because much of what happens between relationship partners is likely to occur at an automatic level (see Chen, Fitzimons, & Andersen, 2007). This fits with a broader trend in contemporary psychology emphasizing that many processes, including attentional orienting (e.g., Shiffrin, & Schneider, 1977), emotional appraisal (e.g., Lazarus, 1991), attitude activation (e.g., Chaiken, 1980; Gawronski & Bodenhausen, 2006), social perception (e.g., Bargh, 1994), and even goal-directed behaviour (e.g., Bargh, 1990), do not necessarily require conscious control. In the present research project, we aimed at incorporating these ideas into the study of adult attachment by focussing on implicit (i.e., automatically activated) representations and cognitive-motivational processes that underlie individual differences in attachment functioning.

In this introduction, we discuss various aspects of the theory and evidence on attachment representations and processes. Before narrowing down to the theoretical assumptions directly relevant to the present dissertation, we first provide some general background information that is useful for situating our line of research into a broader perspective. We begin with an overview of theory and research on child attachment as a point of departure for understanding how attachment representations and processes may be characterized in adulthood. Next, we proceed to a description of measurement issues, followed by a definition of attachment relationships. From there, we discuss the model on attachment system dynamics in terms of working models and attachment strategies and then briefly lay out some basic ideas regarding automatic and controlled processes in relation to attachment. Finally, we conclude with a

discussion of the specific topics that the present research aimed at investigating, namely attention, action tendencies, goals, and the attachment self-concept.

ADULT ATTACHMENT: BACKGROUND

"Attachment theory regards the propensity to make intimate emotional bonds to particular individuals as a basic component of human nature, already present in germinal form in the neonate and continuing through adult life into old age." (Bowlby, 1988, p. 120-121)

From Child Attachment to Adult Attachment

Attachment theory was originally formulated by John Bowlby (1969, 1973, 1980, 1988) who attempted to describe and explain how and why infants get emotionally attached to their primary caregivers and emotionally distressed when separated from them. Bowlby postulated that infants are born with a repertoire of behaviours organized within a behavioural motivational system that serves the function of protection, and hence survival, by regulating proximity to the caregiver when confronted with distress. His theory was extended in important directions by Mary Ainsworth and colleagues (1978) who delineated individual differences in attachment patterns by observing the behaviour of young infants in response to separation from and reunion with the caregiver (i.e., the well-known Strange Situation procedure). Children exhibiting a *secure* attachment style are somewhat distressed during separations from the mother, but recover quickly, react with joy and affection, and are easily soothed upon reunion. *Anxiously* attached children are observed to be highly distressed during separations and show anger and resistance when the mother returns. Yet, at the same time, they yearn for physical contact and comfort. These dynamics result in contradictory and ambivalent responses towards the mother. *Avoidant* infants, on the other hand, are marked by little distress when separated from the mother and tend to avoid proximity when she returns.

Drawing on home observations, Ainsworth et al. (1978) further concluded that these attachment behaviours are often adaptive in light of parental responses. Specifically, it was found that the mothers of *secure* infants were emotionally available and consistently responsive to their children's signals of

distress and proximity seeking. As a result, secure children are less concerned with security attainment and display a more open and flexible attitude towards exploring the environment. In the case of *anxiously* attached children, the mothers were observed to be unpredictable and inconsistent in their care, which partially reinforces the child's attempts to seek proximity and security because they sometimes succeed in their proximity-seeking efforts. Consequently, such children become highly sensitive to potential unavailability and maximize their efforts to remain in close contact with the caregiver. The mothers of *avoidant* children were observed to be emotionally rigid and overly rejecting towards the child's proximity seeking behaviour. In addition, these mothers were found to discourage emotional expressiveness during the Strange Situation Test by withdrawing from their infants during moments of strong negative affect (Grossmann, Grossmann, & Schwan, 1986). In reaction to these rejecting responses, avoidant children have learned to suppress their needs and feelings of distress and give up their proximity-seeking efforts. Main and Solomon (1986) later added a fourth attachment pattern, namely *disorganized* attachment, in order to describe the behaviour of children who display chaotic behaviour and unusual fluctuations between anxiety and avoidance (i.e., contradictory tendencies to escape from and approach the attachment figure). This pattern of behaviour is assumed to result from hostile, frightening, and unpredictable behaviour on the part of the (often traumatized) attachment figure, who is unable to provide adequate care. In summary, the evidence on child attachment styles suggests that, driven by the goal of security attainment, children develop emotional and behavioural regulation strategies that are adaptively tuned to the types of parenting they encounter. Note, however, that the quality of attachment is not determined solely by social learning mechanisms, but is also strongly influenced by infant characteristics such as temperament (e.g., emotional reactivity; most likely in interaction with parental responses) (e.g., Kochanska, 1998; Mangelsdorf, Gunnar, Kestenbaum, Lang, & Andreas, 1990).

Certainly one of the most central ideas in Bowlby's attachment theory is that, over time, children internalize repeated interactions with the caregiver into mental representations. These *internal working models* can be regarded as knowledge structures that are stored in one's long-term associative memory network and include beliefs about the self and others. When a child repeatedly experiences that his/her attachment behaviour is successful in eliciting care and

proximity from the attachment figure, this is likely to result in the development of positive beliefs about one's own competence and lovability, and a view of others as available and responsive. In the case of inconsistent or rejecting care, on the other hand, children are more likely to develop insecure self- and other-models. According to the theory, these working models continue to guide behaviour and affect in later relationships outside the family. That is, as people build new relationships, they often behave in ways that are consistent with how they expect to be treated by others and they use these models to interpret the goals or intentions of their relationship partners. Although the biological function of the attachment system is probably most critical during the early phases of life, Bowlby argued that attachment processes continue to influence close relationships across the life span. However, it wasn't until the late 80's that researchers explicitly adopted an attachment theory perspective for understanding adult romantic love (Hazan & Shaver, 1987) and started to conduct systematic research on attachment in adolescence and adulthood.

Adult Attachment Styles: Measurement Issues

From the beginning of attachment research, the individual-differences component of attachment theory has attracted most research attention. As such, a broad range of studies have focused on identifying individual differences in attachment style and their influence on inter- and intrapersonal processes. When Hazan and Shaver (1987) began their work on romantic attachment, they adopted Ainsworth's three-category scheme as a framework for understanding individual differences in adult romantic relationships and developed a measure to asses the secure, anxious, and avoidant attachment styles. Bartholomew and Horowitz (1991) later expanded this model by delineating four prototypic attachment patterns that can be placed in a two-dimensional space defined by the valence of people's self- and other-representations. The working model of self refers to how worthy and lovable the self is in the eyes of the attachment figure, whereas the working model of other refers to the degree to which others are perceived as being available and responsive to one's needs (Bowlby, 1969, 1982). *Secure* individuals typically have positive views of self and others. They find it relatively easy to become emotionally close to others, and feel comfortable depending on others and having others depending on them.

Preoccupied individuals are assumed to have a positive self-model and a negative other-model. They desire extreme intimacy with others, but find that others are reluctant to get as close as they would like. The avoidant style is divided into two types. *Dismissing* individuals are described as having a positive self-model and a negative other-model. They are assumed to feel comfortable without close emotional relationships, place great emphasis on independence and self-reliance, and prefer not to depend on others or have others depending on them. *Fearful* individuals, on the other hand, are assumed to have a negative view of both self and others. They feel uncomfortable with getting close to others because they fear that they will be hurt; yet, they do acknowledge wanting emotionally close relationships. An important difference between both types of attachment avoidance is that dismissing individuals are believed to adopt an avoidant orientation as a means to maintain a defensive sense of self-reliance and independence, whereas fearful individuals would be behaviourally avoidant because they fear interpersonal rejection (Griffin & Bartholomew, 1994). As such, the fearful pattern also shows great overlap with attachment anxiety. In accordance with their model, Bartholomew and Horowitz developed a forced-choice measure (the Relationships Questionnaire; RQ) consisting of four paragraphs that describe each of the four attachment prototypes. Later, Griffin and Bartholomew (1994) decomposed the paragraphs into a multi-item scale, namely the Relationship Styles Questionnaire.

During the course of years, several other measures have been developed, drawing on various classification systems containing three, four, or even five factors (e.g., Adult Attachment Scale, Collins & Read, 1990; Attachment Styles Questionnaire, Feeney, Noller, & Hanrahan, 1994). In order to provide a more unified approach to the study of attachment-style differences and to maximize internal consistency, Brennan, Clark, and Shaver (1998) constructed a new measure, namely the Experiences in Close Relationships Scale (ECR), by combining all known self-report measures of attachment, factor analyzing the items using taxometric methods, and retaining 36 items that represent two orthogonal higher-order factors. These factors were labelled as *attachment anxiety* and *attachment avoidance*, which refers to the, respectively, emotional and behavioural content of the items. The anxiety dimension represents fear of abandonment and rejection by significant others, whereas the avoidance dimension assesses the tendency to maintain emotional distance and

independence from others. People can have low scores on the two dimensions (i.e., secure attachment), high scores on both, or high scores on one of both. It is now commonly accepted that these two dimensions underlie individual differences in attachment and it is also widely recommended to use the ECR or ECR-revised questionnaires. Regarding the latter, a few of the original items of the ECR are replaced to improve the discriminative value of the questionnaire (Fraley, Waller, & Brennan, 2000). Whereas categorical measures of attachment style have been found to be relatively unstable, multi-item scales such as the ECR(-R) generally show adequate test-retest reliability (see Fraley et al., 2000). In the present dissertation, we therefore adopted a dimensional approach to measure attachment differences and consistently used the ECR-revised. Although it has been suggested to rely no longer on the categorical attachment schemes, the four-group approach of Bartholomew can still provide an interesting framework for understanding the results of several studies. Also note that Griffin and Bartholomew already recognised the two-dimensional view on attachment by indicating that the self- and other-dimensions map onto attachment anxiety and avoidance, respectively. Moreover, the Relationships Questionnaire can be adjusted to provide continuous ratings of the four attachment types, instead of forcing participants into a certain attachment pattern (see Fraley & Waller, 1998).

Finally, two concluding remarks on the measurement of attachment styles. Over the years, researchers have used a diverse array of instruments for measuring attachment styles.[1] This impairs the interpretation and comparability of findings across studies, especially with regard to attachment avoidance. That is, it is not always clear whether the avoidant style in three-category measures reflects a single avoidant pattern (i.e., dismissing) or an anxious-avoidant pattern (i.e., fearful). This has nevertheless important implications for understanding the

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[1] Self-report measures are most frequently used within the social-psychology perspective on attachment. Another research tradition, which is rooted in developmental psychology, primarily relies on interview methods for measuring attachment styles. Most common within the narrative tradition, is the Adult Attachment Interview (AAI) which is a semi-structured, clinical interview that measures an individual's current state of mind regarding attachment-relevant experiences during childhood (George, Kaplan, & Main, 1985). The coding of the AAI puts more emphasis on discourse properties (i.e., coherence, anger, believability) rather than the propositional content of the interview (Hesse, 1999), and is based on several continuous scales that are used to classify individuals into three attachment categories (i.e., secure, preoccupied, and dismissive).

obtained results. As a second remark, we would like to mention that, throughout this dissertation, we use the terms secure, anxious, and avoidant individuals for reasons of clarity and brevity. However, these labels should not be interpreted in discrete terms, but rather as regions in a continuously distributed two-dimensional space.

Stability of Attachment Styles and Multiple Working Models

Bowlby maintained that early working models of self and others serve as templates for later relationships, which implies that attachment patterns established during childhood should be stable across the life span (Bowlby, 1969, 1988). In relation to this, working models have been conceptualized as cognitive scripts or schemas (we will elaborate on this later in the introduction) that influence relationship functioning by means of their (presumably automatic) activation and their assimilative influences on information processing in attachment-relevant situations (see Baldwin, 1992, 1995). In other words, people will seek out experiences that confirm their working models and perceive, interpret, and behave upon new information in light of previous beliefs and expectations about self and others, which eventually results in a self-fulfilling prophecy. As such, individual differences in attachment style are assumed to reflect chronically accessible working models. There is supporting evidence for the stability of attachment patterns (based on retrospective studies and some follow-up studies; e.g., Hamilton, 2000; Waters, Merrick, Treboux, Crowel, & Albersheim, 2000). However, the observed correlations between child and adult attachment styles are moderate at best. It is therefore more plausible to assume that attachment styles are malleable. That is, change can result via sustained disconfirming evidence that contradicts the internal working models developed early in life. Accordingly, attachment styles can be modified in response to positive and negative attachment experiences.

This does, however, not necessarily imply that working models are revised and eventually overwritten by new experiences. It could also be that early working models will continue to influence relationship functioning and coexist with newly developed working models (Fraley, 2002). Given that, as we mature, most people have a variety of interpersonal experiences with more than one significant other, it is likely that we possess multiple mental models representing

different ways of relating to others. Logically, some models will be more available and accessible than others, mainly depending on the amount of experience and the amount of exemplars that fit the model (Baldwin, 1992; Baldwin, Keelan, Fehr, Enss, & Koh-Rangarajoo, 1996). In this context, Collins and Read (1994) proposed that attachment styles are organized in a hierarchical structure. At the top of this hierarchy is the *global attachment style*, which represents generalized information about repeated interaction patterns in a variety of attachment relationships. At a lower level are *relationship-specific attachment styles* that may or may not be congruent with one's general attachment style. It is thus possible to have a secure attachment style towards one relationship partner (e.g., mother) and an insecure attachment towards another (e.g., romantic partner). Accordingly, attachment-related thoughts, feelings, and behaviour are likely to differ depending on the specific relationship. Therefore, the studies reported in this dissertation consistently assessed individual differences in attachment at a specific level (i.e., regarding one specific relationship partner).

Defining an Attachment Figure and an Attachment Relationship

Given that adults have multiple interaction partners, it is highly relevant to make explicit the defining characteristics of an attachment figure. According to the theory, an attachment figure is (1) a target of proximity maintenance, (2) functions as a safe haven in times of need (i.e., providing protection, comfort, and support), and (3) serves as a secure base from which non-attachment behaviour is engaged (e.g., Hazan & Shaver, 1994). During childhood, parents are likely to be the primary attachment figure. In adolescence and adulthood, a wide variety of people can serve attachment functions, including close friends, romantic partners, colleagues, etc. Although parents are likely to stay attachment figures during adolescence and adulthood, their function as a primary attachment figure will usually change in the benefit of close friends and romantic partners (Allen & Land, 1999; Fraley & Davis, 1997; Rowe & Carnelley, 2005). Because in the studies reported in this dissertation the samples comprised of adolescents and young adults, we were careful in distinguishing attachment figures from non-attachment figures by using the WHOTO scale that consist of six items referring to the proximity seeking, secure base, and safe haven functions of an

attachment figure (Hazan & Zeifman, 1994; Fraley & Davis, 1997). A person was labelled as an attachment figure if he/she served all three attachment functions.

Drawing on Bowlby's original ideas, Mikulincer and Shaver (2007) further argued that an attachment interaction and an attachment bond have unique features as well. In their view, an interaction can be defined only as an "attachment interaction" if one person is threatened or distressed. Threat can be related to conditions of the person, conditions of the environment, and conditions of the attachment relationship (Bowlby, 1973). Accordingly, an attachment bond and attachment behaviour would become most evident in the context of distress, because there is no need to seek care from others when there is no threat involved, at least not for the purpose of protection. In the absence of distress, interactions may be more affiliative, exploratory, or sexual. As a result, many studies have used distress primes to study attachment processes, ranging from visualisation of threatening scenario's (e.g., Mikulincer, Florian, Birnbaum, & Malishkevich, 2002) to subliminal priming of threatening words (e.g., Mikulincer, Birnbaum, Nachmias, & Woddis, 2000; Mikulincer, Gillath, & Shaver, 2002).

A MODEL OF ATTACHMENT SYSTEM FUNCTIONING

The impetus for the line of research in this dissertation is a model by Mikulincer and Shaver (2003, 2007; Shaver & Mikulincer, 2002) that systematically integrates the original ideas of Bowlby on the attachment behavioural system into a control-system model that puts forward some clear and verifiable assumptions. Drawing on emotion and appraisal theories (Frijda, 1986; Lazarus, 1991) and feedback-control theory (Carver & Scheier, 1981; Powers, 1973), Mikulincer and Shaver conceptualized a model that emphasizes the underlying dynamics of attachment processes and representations in terms of emotion regulation and behavioural self-regulation. The model is presented in Figure 1.

In broad strokes, three modules can be distinguished that are mutually connected through self-regulatory feedback loops, driven by the goal of security and protection.
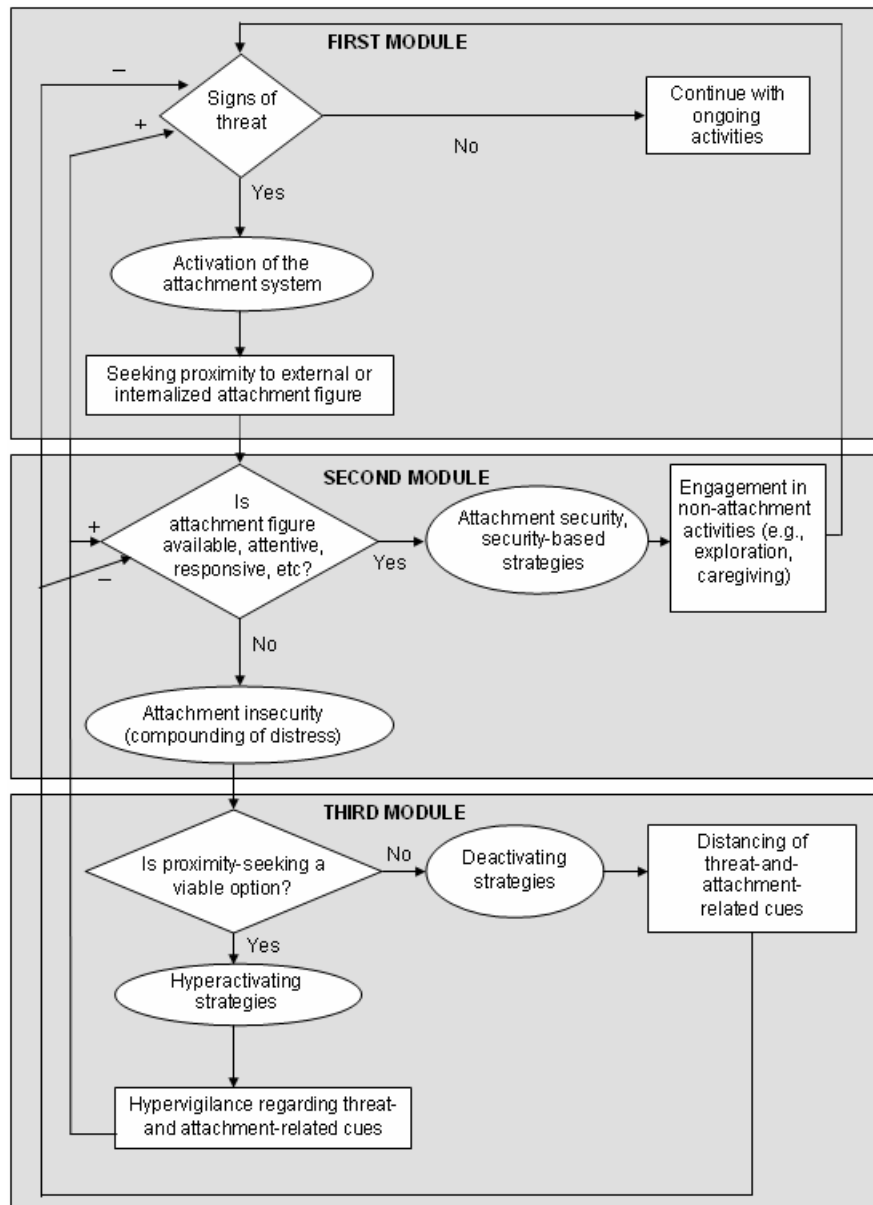

Fig 1. The attachment behavioural system (Shaver & Mikulincer, 2002; Mikulincer & Shaver, 2003)

In a first module, information about environmental changes will be processed, which includes the appraisal and monitoring of (internal or external) threat stimuli that can activate the attachment system. A second module involves the appraisal of attachment figure availability and (memories about past) responses to one's proximity seeking attempts. In a third module, the utility of one's behaviour will be appraised in light of its progress towards security attainment so that, in the case of a continuing goal-discrepancy, the individual can adjust his/her behaviour and/or goals. Furthermore, Mikulincer and Shaver described three different strategies (i.e., primary or security-based strategies, hyperactivating and deactivating strategies) that result from and influence each of these appraisals. The three attachment strategies can be linked to the different attachment orientations that were described earlier (i.e., secure, anxious, avoidant attachment). Hence, in addition to focusing on the normative aspects of relationship functioning, the model also includes an individual-differences component. We will now explain the model in more detail.

Perceived dangers and threats are assumed to activate the attachment system and motivate people to seek proximity towards their attachment figure as a means to attain the set-goal of felt security. Once the attachment system has been activated, this results in a subjective appraisal of attachment figure availability. When the attachment figure is perceived as available, reliable, caring, and responsive to one's proximity seeking efforts, the individual is likely to experience distress reduction and felt security, which will end the activation of the attachment system and promote the engagement in other activities. This sequence corresponds with the primary attachment strategy and is characteristic of secure attachment. However, when the attachment figure is perceived as unavailable, unresponsive, and unable or unwilling to provide a secure base, the primary attachment strategy will be disrupted because the set-goal of security is not attained. In other words, attachment figure unavailability induces a goal-incongruent state that intensifies negative emotions. In response to this continuing distress, people can make behavioural adjustments to attain felt security by adopting secondary attachment strategies that focus on persisting or disengaging from proximity seeking. Hyperactivating strategies are characteristic of anxiously attached individuals, who stay committed to proximity goals by exaggerating the primary attachment strategy. The latter is manifested in intense monitoring of threat and (potential) signs of attachment

figure unavailability and strong efforts to maintain proximity. The main goal of hyperactivating strategies is to get the unavailable attachment figure as yet to be responsive and supportive. As a result, their attachment system is assumed to be chronically active and should end its activation only when the attachment figure is perceived as paying sufficient attention and security-enhancing proximity is attained. Deactivating strategies, on the other hand, are indicated by disengagement from proximity goals and the promotion of independence and self-reliance. These strategies are most likely associated with avoidant attachment and are characterized by the dismissal of threat, the suppression or inhibition of attachment needs and vulnerabilities, and the inhibition of proximity seeking behaviour. Such avoidance-oriented strategies primarily aim at defensively deactivating the attachment system.

According to the model, secure attachment represents the normative sequence for reducing distress and anxiety. Hyperactivating and deactivating strategies, on the other hand, give rise to insecurities and vulnerabilities because they obtain their goals through relying on psychological defences that distort information processing, affect-regulation, and behaviour. The model also posits that it is possible to adopt both hyperactivating and deactivating strategies in parallel, which corresponds with fearful avoidance (see Bartholomew & Horowitz, 1991). The latter is characterized by high levels of anxiety and avoidance and a lack of viable coping actions, because fearful avoidance would derive from a failure to achieve any of the goals of the different attachment strategies.

Attachment Working Models: Representations and Processes

Importantly, Bowlby's working-model concept can also be integrated into this model on attachment system dynamics. In fact, given that attachment working models are built within the context of the attachment behavioural system, they are assumed to contain the history of experiences of that system and reflect the underlying regulatory actions of attachment strategies. As such, working models should not be regarded as including only static beliefs about the self and others, but rather as dynamic and functional concepts associated with information processing (i.e., attention, interpretation, and memory), emotional appraisal, motivational actions (i.e., goal setting, goal pursuit) and behaviour. This indicates that working models and attachment strategies have an

interdependent and reciprocal relationship and thus jointly influence the regulation of the attachment system. More specifically, the attachment behavioural system operates by means of several beliefs and goals that are stored in working models and influence cognitive, affective, and behavioural processes. Hence, a clear test of the attachment system model requires tapping into these representations and their interaction with attachment processes. This was in fact the main objective underlying the present research project. In the following paragraph, we will specify in greater detail what is currently known about attachment working models and their influence on regulatory processes.

The concept of working models is interesting from a social-cognitive perspective, because it is similar to concepts such as 'cognitive scripts' and 'social schemas' (cfr. Baldwin, 1992, 1995). Accordingly, attachment working models have been conceptualised as cognitive-affective structures that contain a network of memories, beliefs, and goals, which are automatically activated in response to attachment-relevant cues. Once activated, they are assumed to play a critical role in directing the cognitive, affective, and behavioural processes that contribute to the activation and regulation of the attachment system (Collins et al., 2004). The influence of attachment schemas on *cognitive* processes fits with a common idea in social-cognitive research that prior knowledge will automatically influence information processing (i.e., attention, interpretation, and memory), social construal, and so on.

The role of attachment schemas in guiding *emotional responses* has thus far received most empirical attention. In line with emotion and appraisal theories (e.g., Frijda, 1986; Scherer, 1988), it has been argued that people will automatically appraise (attachment-related) environmental changes in relation to (inter)personal goals that are stored in working models (Shaver, Schwartz, Kirson, & O'Connor, 1987). In general, people will react with positive affect if a goal is attained or facilitated and with negative affect if a goal is blocked. The resulting emotions have an impact on further information processing, action tendencies, physiological changes, and so on. Interestingly, the role of working models in the generation, regulation, and expression of emotions can also be framed in terms of primary and secondary appraisals. The primary appraisal process evaluates whether the environmental change is worthy of attention and whether it is relevant to one's goals and beliefs. In a secondary appraisal, the event will be evaluated in light of one's coping potential - which includes one's

own power and the power to recruit help from others - and expectations about the outcome (Scherer, 1988, 2001). Eventually, this secondary appraisal can change the phenomenology of the emotion by evoking a reappraisal of the input stimuli. Both primary and secondary appraisals are thus likely influenced by attachment working models that can alter or suppress emotional responding by interfering with the detection of potential threat, emotional appraisals, and so on.

Finally, working models will also influence *behaviour* by providing plans and action tendencies associated with attaining attachment-related goals. This implies that behavioural strategies are automatically evoked in response to particular appraisals that activate attachment working models. In relation to this, it is noteworthy that much of the social-psychological research on attachment is guided by a variant of the classic diathesis-stress model, according to which attachment working models will influence attachment-related behaviour primarily under conditions of stress or threat (Fraley & Shaver, 1997, 1998; Simpson & Rholes, 1998).

Individual Differences in Attachment: Cognitive, Emotional, and Behavioural Responses

As described earlier, attachment working models shape cognitive, emotional, and behavioural responses in attachment-relevant contexts. In most of the attachment research, working models have been treated as an individual-difference variable that is assessed via self-report measures (e.g., Hazan & Shaver, 1987). In this section, we will describe some of the characteristics of attachment-style differences that have received empirical support and are relevant to the research reported in this dissertation. For a more complete and detailed overview, we refer to a recent book by Mikulincer and Shaver (2007) that provides an impressive review of the thousands of studies on adult attachment, published over the past 20 years. The studies that are directly relevant to the present research will be described in more detail in the corresponding chapters.

Secure individuals are assumed to regulate emotions in a constructive way by engaging in problem-solving, cognitive reappraisal, and proximity-related responses. In relation to the theory, it has been demonstrated that secure individuals automatically activate proximity-related thoughts (Mikulincer, et al.,

2000) and mental representations of the attachment figure (Mikulincer, et al., 2002) in response to distress-cues. They are also found to seek support from the attachment figure (e.g., Fraley & Shaver, 1998; Simpson, Rholes, & Nelligan, 1992), to rely on problem-focused coping (e.g., Mikulincer & Florian, 1998), and to keep a balance between relying on others and relying on themselves when coping with distress (e.g., Scharf, 2001). Additionally, they are believed to attend to and express distress without distortions, because they are confident that they can manage distress successfully. As such, they often reappraise the threat as a challenge, which eventually results in a reduction of it stressful effects. In this context, secure individuals have been found to display more hopeful and positive appraisals and stronger ego-resilience (e.g., Kerns & Stevens, 1996; Birnbaum, Orr, Mikulincer, & Florian, 1997). In addition to seeking support from others, secure individuals may also rely on what Mikulincer and Shaver (2004) call 'security-based self-representations'. Such representations are assumed to evolve from soothing interactions with the attachment figure and contain positive feelings and beliefs about the self as capable of dealing with distress. Accordingly, when confronted with threat, a secure individual does not necessarily need to rely on the attachment figure, but can also evoke security-based self-representations that assist in reducing distress.

Attachment *anxiety* is marked by intense distress reactions and overwhelming experiences of negative emotions. According to the theory, anxious individuals are guided by an unfulfilled wish to gain attention and support from the attachment figure, which causes them to intensify the expression of emotions that emphasize their vulnerability and helplessness (e.g., distress, sadness, and fear). This is likely to result in a dysregulation of negative emotions, which is manifested in hypervigilance to internal and external signals of threat, catastrophic appraisals, rumination on threatening thoughts, insistent proximity seeking efforts, and negative beliefs about their own competence for regulating distress. As a result, their attachment system is assumed to be chronically activated (i.e., in both threatening and non-threatening contexts). Empirical support has been obtained for several of these assumptions. For example, individuals characterized by attachment anxiety have been found to automatically activate proximity-thoughts and -worries in response to both threat and non-threat primes (Mikulincer et al., 2000; 2002b). They tend to rely on emotion-focused coping-strategies, exaggerate their distress reactions (e.g.,

Maunder, Lancee, Nolan, Hunter, & Tannenbaum, 2006), are unable to suppress threat-related thoughts (Fraley & Shaver, 1997), and appraise threat as extreme and coping resources as deficient (e.g. Birnbaum, Orr, Mikulincer, & Florian, 1997; Mikulincer & Florian, 1995, 1998). Furthermore, they display intense wishes for security and proximity (see Baldwin, Fehr, Keedian, Seidel, & Thompson, 1993; Gillath, Mikulincer, Fitzsimons, Shaver, Schachner, & Barg, 2006), which are however not manifested in actual proximity seeking behaviour. That is, so far, behavioural observation studies failed to find a significant relation between attachment anxiety and support seeking. This lack of association has been explained by referring to their ambivalence and doubts about attachment figure availability (e.g., Fraley & Shaver, 1998; Simpson et al., 1992).

Attachment *avoidance* is characterized by the inhibition, denial, and suppression of emotional states that are incongruent with the goal of down-regulating the attachment system (see Mikulincer & Shaver, 2007). It is further assumed that avoidant individuals divert attention away from threat-related material, suppress attachment-related behaviour as a means to minimize closeness and interdependence, and prefer to rely on themselves when coping with distress. In relation to the theory, research has confirmed that avoidant individuals rely on distance-coping strategies, appraise their coping resources as adequate, report lower levels of support seeking, exhibit less desire for closeness, and inhibit (actual) proximity seeking behaviour, especially in the context of distress (e.g., Gilllath et al., 2006; Mikulincer et al., 2000; Fraley & Shaver, 1998). It has also been found that avoidant defences are effective in suppressing separation-related thoughts, as indicated by less interference of separation-related thoughts following a suppression-task and lower skin conductance during suppression (Fraley & Shaver, 1997). Based on these findings, it has been concluded that the defensive strategies underlying attachment avoidance can operate fairly effortlessly and without taxing cognitive resources. On the other hand, there is growing evidence that avoidant defensive strategies are not always successful in inhibiting the experience and expression of negative emotions and that the efficacy of such strategies can become attenuated over time, in highly stressful situations, and when concurrent tasks are imposed. That is, when confronted with severe and persistent distress such as, for example, a divorce (Birnbaum et al., 1997) or wartime separations (e.g.,

Cafferty, Davis, Medway, O'Hearn, & Chappell, 1994), avoidant individuals do report high levels of distress and even rely on emotion-focused coping (also Berant, Mikulincer, & Florian, 2001). Their emotional reactivity could also be demonstrated in studies examining physiological reactions in response to stress cues. It has been found, for example, that avoidant individuals display heightened physiological arousal (skin conductance, hart rate, and blood pressure) when recalling a stressful situation (Diamond, Hicks, & Otter-Henderson, 2006), when discussing relationship problems (Kim, 2006) and when watching a film on relationship distress (Maunder et al., 2006). Using brain imaging techniques, Gillath, Bunge, Shaver, Wendelken, and Mikulincer (2005) added to this line of research by demonstrating that avoidant individuals failed in fully deactivating the cingulate cortex and the lateral prefrontal cortex - that are normally used to down-regulate negative emotions - when suppressing negative (attachment-related) thoughts and emotions. Some studies even found a dissociation between avoidant's self-reports and their physiological responses (when discussing painful childhood memories during the AAI, Dozier & Kobak, 1992) and projective responses on the Thematic Apperception Test (regarding death-related anxiety, Mikulincer, Florian, & Tolmacz, 1990). Given that the emotional reaction patterns of avoidant individuals seem to differ depending on the level at which they were measured, the above studies may suggest that the defensive strategies of avoidant individuals are specifically oriented at blocking the 'conscious' experience and expression of emotions. On the other hand, there is also evidence that the regulatory mechanisms underlying avoidant attachment do not interfere only with self-reported responses, but also operate at the automatic level. For example, it has been found that avoidant individuals display lower cognitive activation of separation-related thoughts on the Stroop colour naming and lexical decision task, which are both indirect measurement procedures (Mikulincer et al., 2000; Mikulincer, Dolev, & Shaver, 2004). Note, however, that their defences seemed to collapse when a cognitive load was imposed (as indicated by higher accessibility of proximity worries and separation thoughts). Other evidence stems from a study by Fraley, Garner, and Shaver (2000) in which participants listened to an interview about the loss of a close partner and were asked to recall details about the interview. When analyzing the forgetting curves, it appeared that avoidant individuals had initially encoded less information about the interview, which was taken as evidence that

avoidant defences act pre-emptively by blocking threatening stimuli from further information processing. Another interesting observation is that avoidant responses depend on the nature of the threat prime. For example, Mikulincer and colleagues (2002) showed that attachment avoidance was associated with lower accessibility of the name of the attachment figure only when primed (subliminally) with a separation word, but not when primed with a failure word.

The above overview suggests that the attachment system is primarily involved in the regulation of negative emotions. Given that attachment strategies have been developed in the context of distress and thus mainly serve distress-alleviating functions, it has indeed been argued that distress is the most important trigger of the attachment system (Mikulincer & Shaver, 2003). Nevertheless, it is likely that positive emotions will also play a role in the regulation of the attachment system, because positive emotions contribute to shaping and enhancing attachment bonds, assist in mood-regulation, and result from the achievement of attachment-related goals. Furthermore, there is no doubt that people experience both positive (e.g., acceptance, love, joy) and negative (e.g., fear, anger, frustration) emotions in their attachment relationships. Although much less is known about the regulation of positive affect as a function of attachment, a few studies have been directed at examining the moderating role of attachment style in the experience of and reactions to positive affect (e.g., Mikulincer & Shaver, 2005; Mikulincer & Sheffi, 2000). It has been theorized that secure individuals appraise positive affect as reinforcing, which may cause them to engage in flexible cognitive processing when being in a positive mood. Avoidantly attached individuals, on the other hand, are assumed to suppress positive emotions, because emotions of joy and happiness promote interpersonal closeness and represent goal-incongruent information. As a result, avoidant individuals will react to positive affect with cognitive closure in order to prevent that such affect will influence further information-processing. Anxious individuals would also appraise positive affect as a goal-incongruent state, because it reminds them of what they believe they do not have. Furthermore, given that their attachment system is assumed to be chronically activated, they are less likely to engage in relaxed exploration following a positive affect induction. In relation to these hypotheses, research has demonstrated that secure individuals react to positive affect with broader mental categorization and better

performance in creative problem-solving tasks. Avoidant individuals, on the other hand, were found to be unaffected by positive affect inductions, whereas anxious individuals failed to report positive mood and displayed worse performance on problem-solving tasks after the induction of positive affect (Mikulincer & Sheffi, 2000).

AUTOMATIC AND CONTROLLED PROCESSES IN ADULT ATTACHMENT

Traditionally, most of the evidence on (interindividual differences in) the *content* of working models stems from studies relying on self-report questionnaires. Although such measures can be extremely useful for identifying conscious representations that people can introspect and articulate, many aspects of working models are assumed to lie outside conscious awareness and are therefore not available for reflection and report. Moreover, even when people are capable of providing accurate reports of their thoughts, feelings, and behaviour in their relationships, they may sometimes be motivated to distort these thoughts and feelings in the service of self-regulation and self-presentation (Collins, et al., 2004). Also note that self-report measures are unable to tap into the automatic *processes* that underlie attachment strategies and working models. Over the past 10 years, attachment researchers have therefore shown increased interest in social-cognitive methods that allow investigating attachment processes and representations at the automatic level. This evolution was also driven by (1) a more general trend towards integrating social-cognition research with the study of relationship phenomena (Reis & Downey, 1999), (2) the broader interest in research on automaticity, (3) the popularity of implicit measures, which are assumed to be less prone to social desirability biases and other self-protective distortions compared to self-report measures (e.g., Fazio & Olson, 2003), and (4) the specific need for a more direct test of hypotheses derived from attachment theory in which several claims are made about the automatic nature of attachment-related processes. This last point is crucial because attachment strategies and underlying working models have repeatedly been described as habitual, over-learned structures that can operate in an automatic mode (e.g., Bowlby, 1969; Mikulincer & Shaver, 2003, 2007). Hence, more empirical research is needed to investigate whether attachment strategies do indeed operate at the automatic level and whether attachment-related representations can be

activated automatically and can have an automatic influence on cognition, affect, and behaviour. Before we go more deeply into the specific research questions of this dissertation, we first describe some general notions about the role of automaticity in attachment system functioning. Afterwards, we will define what is meant by the term 'automaticity' and illustrate how this definition can be applied to attachment theory and research.

The Role of Automaticity in Attachment

Several researchers have explicitly mentioned the role of automatic processes and automatically activated representations in the context of attachment. Bowlby already recognized that working models can influence attachment processes in a defensive, self-protective fashion (Bowlby, 1980; see also Cassidy & Kobak, 1988; Main, 1991). He also emphasized that working models are strengthened by practice and repetition and eventually begin to function automatically. Accordingly, working models are assumed to 'unconsciously' bias information processing, interpersonal expectations, and the construction of plans for dealing with distress. It is through these automatic influences that working models are believed to perpetuate in attachment system functioning. Baldwin (1992) further elaborated on Bowlby's idea of working models by conceptualizing the latter as relational schemas that are automatically activated in attachment-relevant situations and produce (automatic) schema-like effects. He introduced the notions of accessibility and availability in the attachment literature and gave the impetus for applying social cognitive tools to the study of implicit attachment-related representations.

In describing their model on attachment system dynamics, Mikulincer and Shaver (2003, 2007) did clearly put more emphasis on attachment processes and strategies, rather than on the content of attachment schemas. According to their model, attachment strategies can operate either consciously or unconsciously and either deliberately or automatically. Moreover, they claim that attachment strategies can operate in parallel, synchronously, or in conflicting ways at conscious and unconscious levels. Although not explicitly mentioned in their writings, the latter would be particularly the case for avoidant individuals, because avoidant defences are most likely driven by self-protective motives (Cassidy & Kobak, 1988; Fraley, Davis, & Shaver, 1998). Recall that several

studies have indeed demonstrated that avoidant responses differ at different levels of measurement (i.e., self-report, physiological indices, and indirect measures; cfr. supra). This does not imply, however, that such defensive processes cannot exist to some extent in all individuals. Finally, it is worth noting that many of the processes involved in attachment system functioning - such as perception, attention, interpretation, evaluation, and so on - have been shown to work well without conscious control (Bargh & Barndollar, 1996).

Defining Automaticity

Given that automatic processes and representations are assumed to play a key role in the functioning of the attachment system, it is most relevant to define what is meant by 'automaticity', because many views exist regarding the definition of this concept.

In defining automaticity, we follow the view of Moors and De Houwer (2006) who provided an impressive analysis of the automaticity-concept and its component features. They argue against the view that automatic and controlled processes are mutually exclusive, with all automatic processes having the same features and all controlled processes having the opposite. In contrast, many processes contain both automatic and controlled features, and for that reason they recommend to deconstruct any process into its component features [i.e., (un)intentional, goal-(in)dependent, (un)controlled, autonomous, purely stimulus-driven, (un)conscious, (non)efficient and fast(slow)].[2] To label a process as automatic, it is important to specify which features apply to the process and to which degree they are present. In other words, a process may be considered automatic in varying senses and to varying degrees, depending on the particular features it meets.

Applying this analysis to the conceptualization of adult attachment has clear heuristic potential. First of all, it points to several misconceptions in attachment research about the role of automatic processes. For example, confusion exists between the terms 'automatic' and 'unconscious' and often these are used interchangeably (also note the current debate on whether self-report measures or the AAI are able to tap unconscious processes, e.g., Shaver & Mikulincer, 2002).

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[2] For a more detailed discussion of what these features mean, how they are related, and how they can be assessed, we refer to their paper.

However, according to the aforementioned analysis on automaticity, unconsciousness may be a feature of automatic processes, but not all automatic processes need to be unconscious. Secondly, the analysis of Moors and De Houwer (2006) could also provide a useful framework for understanding and interpreting the existing evidence on automatic attachment processes. For instance, the defensive strategies of avoidant individuals may be considered as dependent on the goal of self-protection, self-reliance, and independence, while operating automatically in the sense that these individuals do not engage in self-regulatory strategies (e.g., suppressing emotional reactions or adopting avoidant tendencies) with great intention, control, or awareness. In relation to this, we refer to several studies in which avoidant individuals have been shown to display heightened physiological reactivity to emotional stimuli, even when the goal to prevent the occurrence of this emotional reaction is present (e.g., Diamond et al., 2006; Dozier & Kobak, 1992). Other interesting evidence stems from studies using a dual-task paradigm, revealing that avoidant individuals showed faster reaction times on words reflecting proximity worries (in a Stroop colour naming task) when a cognitive load was imposed compared to when no load was present (e.g., Mikulincer et al., 2000, also see Mikulincer, et al., 2004). This suggests that the activation of proximity worries occurs efficiently, whereas the suppression of proximity worries does not operate in an efficient manner. Suppression may, however, still function automatically, in the sense that avoidant individuals do not intentionally or controllably engage in suppression and are usually not aware of this interference. These examples indicate that it makes no sense to consider deactivating strategies as yielding purely automatic or purely controlled processes; an idea that is nevertheless implicitly present in (early) thinking about defensive attachment strategies. That is, the deactivating strategies underlying attachment avoidance have repeatedly been described as being under conscious control, because such strategies would require attentional resources to override automatic reactions (e.g., Mikulincer et al., 2000). The above reported analysis made clear, however, that defensive strategies may be regarded as slow, non-efficient, and goal-dependent, but can still be called automatic in the sense that they may possess one or more of the other automaticity features, such as being unintentional, uncontrolled, or unconscious. Clearly, this also applies to the other attachment strategies and processes.

The automatic activation of working models and their automatic influence on information processing, affect, and behaviour can also be analysed according to this feature-based approach. Working models are generally conceived as chronically accessible knowledge structures that have frequently been activated over time (see Baldwin et al., 1996; Collins et al., 2004). In addition, contemporary research has shown that working models can also be activated on a temporary basis using different priming techniques (e.g., Baldwin et al., 1993; Pierce & Lydon, 2001; Rowe & Carnelley, 2003).[3] Regardless of whether these mental models are chronically activated or manipulated in the lab, participants are typically not aware or consciously intend to activate or rely on these working models when making judgements or planning behaviour. Moreover, working models are likely to exert their influence in an uncontrollable and efficient manner. An important implication of the automatic activation of working models is that people tend to pursue goals and strategies that they have relied on in the past to provide them with security, regardless of whether those strategies are adaptive within their current interpersonal environment. In other words, people often rely on over-learned schemas at the expense of conducting more controlled and effortful processing of information.

Interplay Between Automatic and Controlled Processes

Although (certain aspects of) working models are believed to operate without conscious awareness, their content and outcome can still be reflected in conscious experiences. That is, we can become aware of how we think, feel, and behave in close relationships, and consciously reflect on the plausibility and suitability of these feelings, worries, wishes, plans, or behaviours in certain situations. Also note that we can become aware of the end-products of emotion and behavioural regulation processes (such as attention, appraisal, goal pursuit and so on), while remaining unaware of these processes itself. In this respect, Perugini and Banse (2007) emphasized that deliberative factors must play an important role in human functioning because the evidence on automaticity can explain only a fraction of the total variance in behaviour. This indicates that information processing and behaviour can have both automatic and deliberate

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[3] Note that such priming studies have provided direct evidence that working models do function as cognitive structures that produce schema-like effects.

determinants and that a range of factors can determine the relative influence of these two processes (e.g., Bargh, 1994, 1997; Greenwald & Banaji, 1995). Yet, because the study of explicit attachment processes has thus far been overrepresented in attachment research, the present research project was primarily concerned with measuring the implicit features of working models and attachment strategies.

AUTOMATIC ATTACHMENT PROCESSES AND REPRESENTATIONS

The introduction has thus far provided a brief review of the major propositions of attachment theory and identified the specific components of working models and attachment strategies that form the basis of individual differences in attachment style. We have discussed how working models and related strategies can be conceptualized, how they are developed and perpetuated, how they are involved in cognitive, affective, and behavioural responding, and in what sense and to which degree their activation and use can be called automatic. In providing this overview, we have explained that current thinking on attachment is based on a well-defined model on attachment-system dynamics that yields many clear and testable assumptions. The impressive amount of empirical convergence, stemming from multiple methods, points to the plausibility and validity of attachment theory. However, further theoretical refinement and empirical research is needed to confirm several assumptions of attachment theory that have not yet been tested, especially regarding the automatic nature of attachment-related representations and their influence on cognitive, affective, and motivational processes.

Measuring Automatic Processes and Representations

The aim of the present research project was twofold. A first aim was to investigate attachment-style differences in implicit (i.e., automatically activated) **attachment-representations**. As reported above, many aspects of attachment working models operate automatically and are not necessarily available for reflection and report. Therefore, self-report questionnaires, in which participants are directly asked about their thoughts, feelings, or attitudes, can provide only limited information on the content of working models. Furthermore, self-report

measures may produce biased results because they are subject to demand characteristics, evaluation apprehension, and social desirability (Greenwald et al., 2002). To overcome these disadvantages, research on attachment-related representations could benefit from the use of so-called 'implicit' measures. Drawing on Moors and De Houwer's (2006) feature-based approach on automaticity, an implicit or automatic measure can be defined as "a measurement outcome that reflects the to-be-measured construct by virtue of processes that are uncontrolled, unintentional, goal-independent, purely-stimulus-driven, autonomous, unconscious, efficient, or fast" (De Houwer & Moors, 2007, p.188-189). During the past decade, attachment researchers have started to rely on such implicit measures to explore attachment-related constructs at the automatic level. These measures include implicit memory tasks, semantic and affective priming techniques, the lexical decision task, and the Implicit Association Task (e.g., Baldwin et al., 1993; Mikulincer et al., 2000, 2002; Zayas & Shoda, 2005). Implicit measures produce outcomes that can be called automatic in the sense that respondents do not consciously intend to activate a certain attitude or cognition, or in the sense that they cannot control (i.e., stop, change, or alter) the translation of the construct into the measurement outcome (e.g., the evidence on faking in the IAT, Steffens, 2004). As such, implicit measures are assumed to be less easily distorted by forces that might motivate false responding. Furthermore, it is assumed that these measures operate efficiently, using a minimum of attentional resources. Although current attachment research has moved towards exploring the implicit features of working models, the majority of this research does not tap directly into the goals and beliefs that are automatically activated in response to attachment-relevant cues. That is, most of these studies have relied on the lexical decision task for measuring the *accessibility* of cognitive representations, which is just one possible tool for investigating attachment-related beliefs under conditions of automaticity. In fact, accessibility is a rather remote index of the presence of certain representations. For instance, although the presence of a belief "security is good" should lead to a high accessibility of the concept "security", one cannot simply infer the presence of the belief on the basis of an observed accessibility of the concept. This is because the accessibility could result for other beliefs (e.g., "security is bad") or factors other beliefs (e.g., the mere activation of "security" without a link with "good"). Therefore, we looked for implicit

measures that would provide less remote indices of attachment representations. Given their central role in shaping attachment behaviour, the specific representations we focused on were *interpersonal goals* and *representations of the self* in relation to others.

In addition to exploring the content of an individual's working model, we were also interested in measuring the influence of representational models on the **processes** that are involved in the activation and regulation of the attachment system. Hence, a second aim of the present research project was to explore the relation between individual differences in attachment working models and attachment-related cognitive and behavioural processes, namely *attention* and *behavioural action tendencies*. Given that self-report questionnaires can tap only into the end-products of information processing, but not into the processes itself, we used indirect measures that are able to capture these processes under conditions of automaticity. That is, attentional and behavioural processes were inferred from a participant's performance on experimental paradigms that are better suited to measure automatic attachment-related processes.

Beyond the question of individual differences, the studies reported in this dissertation were also interested in examining the automatic influence of **distress** on attachment processes and representations. Therefore, we induced (in several of our studies) a distress prime before administering the experimental paradigms. Whereas previous studies often relied on subliminal priming, we used a priming procedure in which participants were asked to consciously visualize and reflect on a certain (distressing) situation (also see Mikulincer, et al., 2002). When using subliminal priming, it is clear that participants are unaware of its effect on subsequent information processing. When using a more explicit visualisation task, it could be argued that the distress-prime requires conscious reflection, which may interfere with the processing of attachment-cues. However, its activation and subsequent effects can still be called automatic in the sense that they occur efficiently and in the absence of intention, awareness, and control.

Two final notes concerning the use of explicit and implicit measures in attachment research. First, in addition to theoretical reasons, there are also methodological reasons for relying on other measures than self-report. That is, the items of attachment style questionnaires often show overlap with the items of questionnaires on attachment correlates such as self-disclosure, interdependence, anxiety, self-esteem, etc. Therefore, part of the observed relationships may be

attributed to shared method variance or shared social desirability. In this respect, reaction time measures could be useful to provide independent evidence on the relation between attachment styles and several relationship variables. Secondly, the above overview may give the impression that self-report measures cannot provide valid information on attachment-related beliefs. However, we want to emphasize that this is not the case. Given that both implicit and explicit processes and representations are involved in attachment system functioning, it is essential to apply both direct and indirect measurement procedures to the study of attachment dynamics.

In the following sections, we will briefly lay out the **theoretical assumptions**, the **empirical evidence**, and the **specific research questions** on the attachment-related processes and representations we focused on in this dissertation, namely *attention*, *action tendencies*, *goals* and *self-representations*.

ATTACHMENT PROCESSES

Cognitive Response Patterns: Attachment and Attention

One of the assumptions of attachment theory that has received little empirical consideration so far concerns the relation between individual differences in attachment style and attentional processing. This is remarkable given that selective attention is assumed to be a key strategy for regulating affect and as such plays a central role in attachment system functioning. Because research on the attachment-attention link would contribute to a general understanding of attachment functioning and reveal clinically relevant information, the first part of this dissertation aimed at addressing the lack of research in this area by conducting a series of studies that examined the proposed hypotheses on attention allocation as a function of attachment style.

Attachment theory (Bowlby, 1969, 1982) puts great emphasis on the role of attentional processes in the etiology and maintenance of characteristic relationship behaviour that forms the basis of an individual's attachment orientation. Specifically, the theory suggests that attachment-related differences in attentional biases result from an individual's learning history, represent implicit strategies for regulating emotional distress and proximity, and assist in the perpetuation of one's attachment style. Accordingly, it can be expected that

attachment working models provide an orienting framework for directing attentional resources towards or away from attachment-relevant cues and as such bias further information processing in a goal-relevant and expectation-consistent manner (see Collins et al., 2004). These propositions fit with the general idea in cognitive psychology that individuals guide attention to information that is relevant to their currently active goals and consistent with their existing attitudes and expectations (e.g., Bargh, 1984; Srull & Wyer, 1986). Theoretical predictions on attentional orienting are most explicitly developed for attachment anxiety and avoidance. *Anxiously* attached individuals are assumed to be hypervigilant towards negative, threatening information and would be constantly monitoring their attachment figure's whereabouts. Their threat- and rejection-oriented focus would keep them vigilant for signs of disapproval by others and incline them to notice "evidence that confirms their fears while overlooking information that is inconsistent with their expectations" (Collins & Read, 1994, p. 72). The attentional focus of *avoidant* individuals should be characterized by a very different pattern. Their motivation to reduce attachment-relevant affect and suppress attachment needs would incline them to direct attention away from stimuli that might cause unwanted activation of the attachment system, such as attachment figure-related cues or emotionally threatening information (e.g., Bowlby, 1988; Fraley, Davis, & Shaver, 1998). In the case of *secure* attachment, predictions are less clear.[4] On the one hand, secure individuals can be expected to avoid threat-related information, due to their low levels of anxiety. On the other hand, they may also attend to this kind of information because they are assumed to be cognitively open to explore (even goal-incongruent) emotional stimuli (Mikulincer & Shaver, 2007, Zeijlmans Van Emmichoven, van Ijzendoorn, deRuiter, & Brosschot, 2003). In this respect, it is worth noting that attachment theory puts the greatest emphasis on the relation between attention and attachment insecurity, because particularly insecure attachment orientations would be characterized and maintained by attentional biases. Accordingly, it can

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[4] Throughout this dissertation, our hypotheses on attachment-style differences in cognitive-motivational processes and implicit representations focus primarily on attachment anxiety, avoidance, and security. In the case of high anxious-high avoidant individuals, predictions are less clear. On the one hand, their affect-regulation mechanisms might reflect their high levels of anxiety (e.g., vigilance to threat). On the other hand, their responses might also reflect their avoidance-oriented tendencies (and thus block cognitive access to and processing of emotional, attachment-relevant information).

also be expected that secure individuals will show no attentional bias at all. In addition, given that the attachment system is primarily concerned with the regulation of threatening information, no clear-cut predictions can be made on attentional effects involving positive stimuli. However, it could be that insecurely attached individuals will direct attention away from positive, attachment-relevant information, because positive attachment experiences may be appraised as unobtainable and thus frustrating (see Gray & McNaughton, 2000).

According to the model on attachment system dynamics, attention may serve two important functions in the regulation of the attachment system: (1) the triggering of the attachment system by directing attention to threatening and emotional information and (2) the regulation of proximity by directing attention to attachment figure-related cues. There is, however, little direct evidence on the role of selective attention in the context of attachment. Although several researchers have interpreted their results in terms of attachment-related attentional processes, most of these studies have focused on related aspects such as memory biases, and relied on methods that cannot provide a rigorous or unambiguous test of attentional orienting. Regarding the research on memory biases, evidence is most consistent for avoidant individuals who show difficulties recalling (especially negative) attachment-related experiences (Edelstein, 2006; Fraley et al., 2000; Mikulincer & Orbach, 1995). In relation to this, Fraley et al. proposed that avoidant individuals' memory deficits result from attentional mechanisms that limit the processing of potentially threatening stimuli (Fraley et al., 2000). Furthermore, researchers using a morph-movie paradigm - in which a series of facial expressions ranging in intensity are presented - have also interpreted their results as reflecting attentionally mediated biases associated with attachment style (Niedenthal, Brauer, Robin, & Ines-ker, 2002; Fraley, Niedenthal, Marks, Brumbaugh, & Vicary, 2006). Note, however, that this method may be more closely related to interpretational, rather than attentional, processes. Other studies adopted a categorical approach for measuring attachment styles and/or relied on an emotional Stroop task for measuring attention (Edelstein & Gillath, 2008; Zeijlmans Van Emmichoven, et al., 2003), which also suffers from interpretative difficulties regarding the study of attentional processes (Mogg, Bradley, Dixon, Fisher, Twelftree, &

McWilliams, 2000).[5] These examples make clear that most studies to date have focused on the possible effects of attention, rather than measuring attention allocation directly. As such, they can provide only suggestive, but not conclusive, evidence on selective attention as a function of attachment. More valid tests are thus needed to investigate the assumed relationships between attachment style and attention to emotional information. Moreover, no research to date has investigated the role of attention in regulating proximity goals by focusing on attention to attachment figure-related cues.

Because little is known about attachment-related differences in attention, the general attentional bias literature could be informative for research on the link between attachment and attention to emotional information. An important finding in this literature is that high-anxious individuals preferentially allocate attention to threat-related information (see Williams, Watts, MacLeod, & Mathews, 1997, for a review), whereas low-anxious individuals sometimes direct their attention away from threat (e.g., Bradley et al., 1997, MacLeod, Mathews, & Tata, 1986). Several models have been proposed to clarify the role of selective attention in the development of anxiety disorders. Initially, schema- and associative-network theories were prominent in explaining selective attention associated with anxiety (e.g., Williams et al., 1997). According to these theories, high-anxious individuals would possess threat schemas that are more elaborated and thus more readily activated by threat-cues than those of low-anxious individuals (Beck, 1976). Such threat schemas are assumed to guide attention towards schema-congruent information, which leads to the confirmation and intensification of those schemas and eventually contributes to the maintenance of anxiety. Recall that this schema-idea is closely related to the concept of working models which are also likely to perpetuate through positive feedback loops (e.g., Fraley & Waller, 1998). That is, people are assumed to automatically - in the sense of unintentionally, uncontrollably, unconsciously, and efficiently (see Moors & De Houwer, 2006) - encode information in terms of their past attachment experiences that are mentally represented in working models, creating a confirmation bias. Over the years, schema-theories have been criticized and other models have been put forward (e.g., Mathews, &

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[5] The studies directly relevant to our research questions will be described in more detail in the corresponding chapters.

Mackintosh, 1998; Eysenck, 1992, 1997; Mogg & Bradley, 1998; Williams, Watts, MacLeod, & Mathews, 1988). Probably most directly related to the present research is the model of Eysenck (1997), who postulated that attentional biases are a function of both anxiety and defensiveness. His idea is based on the observation that so-called 'repressors'- defined as scoring low on anxiety and high on defensiveness - display greater physiological arousal in response to threat, compared with true low-anxious and high-anxious individuals, while reporting little subjective experience of distress (Weinberger, 1990; Weinberger, Schwartz, & Davidson, 1979). Eysenck suggested that this discrepancy may be explained by their attentional pattern that would be characterized by attentional avoidance of internal and external threat-cues. Although there has been some discussion about the extent to which repressive coping and attachment avoidance are related (despite the conceptual and empirical overlap, see Fraley, et al., 1998), the idea that attentional biases differ depending on the level of both anxiety and defensiveness, is intuitively appealing in terms of attachment theory.

In addition to providing evidence on the relation between attachment style and attention to threatening and emotional information, the present research project also aimed at investigating the role of attention in regulating proximity, once the attachment system has been activated. According to attachment theory, the experience of threat evokes attentional responses that vary according the goals one is likely to adopt. More specifically, it is assumed that the encounter with threat automatically activates security-goals, which in turn drive the perceiver's attention towards a goal-helpful object - such as the attachment figure - who can provide feelings of comfort and reduce negative affect (also see Aarts, Gollwitzer, & Hassin, 2004). These attentional patterns are likely influenced by one's chronically active (sub-)goals that are stored in attachment working models (cfr. infra). Hence, when confronted with attachment figure-related cues, the attentional pattern of anxious individuals should be driven by proximity goals oriented towards the attachment figure, whereas avoidant individuals would orient attention away from such cues.

To assess individual differences in attentional biases for emotional information, a variety of experimental methods have been used, including dichotic listening (Cherry, 1953), modified emotional Stroop (Mathews & MacLeod, 1985), eye tracking (Bradley, Mogg, Millar, 2000), visual dot-probe (MacLeod et al., 1986), and exogenous cueing tasks (Posner, 1980). In the

present series of studies, we have relied on the dot-probe and exogenous cueing tasks, because these are most widely used in the attentional bias literature and provide a more direct measure of spatial attention (compared to for example the emotional Stroop task). The procedure of these tasks will be described in detail in the corresponding chapters. Attentional effects may vary as a function of the specific stimulus onset asynchrony (SOA), which can range from 20 to 3000 ms. This is consistent with theory and research suggesting that attention is a complex behaviour occurring in stages (e.g., Posner, 1995). Given its wide-spread use in the literature, we used an SOA of 500 ms in our studies. Furthermore, we used pictures *and* words as stimulus material, because both types of stimuli may elicit different attentional effects. That is, pictures are assumed to be more potent threat signals than words, because they would represent a biologically prepared and less conditioned form of threat (e.g., LeDoux, 1995; Ohman, 1993). On the other hand, pictures cannot unambiguously represent socially complex emotions such as rejection, feelings of abandonment and so on, which are highly relevant emotions in attachment research. Therefore, we have selected verbal stimulus material as well. Finally, because individuals are most likely to direct their attention towards information that is most relevant to their current concerns and produces the greatest degree of schema-activation (e.g., Higgins & King, 1981), we expected that the attentional biases associated with attachment working models will be most evident for interpersonal, attachment-relevant information.

Behavioural Response Patterns: Attachment and Automatic Action Tendencies

Another part of the model on attachment system dynamics that needs further examination concerns attachment-style differences in behavioural action tendencies. Individuals are expected to have encoded as part of their working models a set of goals that are associated with concrete plans and action tendencies for regulating and attaining these goals (see Collins et al., 2004). Research has shown that goals can be activated automatically by situational cues and in turn automatically influence affective and behavioural processing (e.g., Dijksterhuis & Bargh, 2001; Ferguson, et al., 2007). People are thus likely to pursue goals with little awareness, intention, effort, or control, and automatically initiate and regulate plans and behaviour in ways designed to fulfil active goals (e.g, Bargh, 1990; Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001).

In this section, we focus specifically on the attachment-related behavioural responses that result from goal-activation. In the following section, we will discuss in more detail the underlying behavioural goals that are part of attachment working models.

Given that behavioural strategies are contingent on one's history of attachment experiences, it is likely that one's attachment style will bias the kind of goals and action tendencies that people habitually pursue in their attachment relationships. In other words, attachment working models will automatically elicit behavioural tendencies that reflect the beliefs, goals, and interpersonal expectations that comprise these models. Being a core element in attachment system functioning, the present research focused specifically on proximity-seeking behaviour, which is the primary attachment strategy for attaining felt security. In relation to this, the theory predicts that attachment *security* is associated with seeking proximity towards the attachment figure when feeling distressed. *Anxious* individuals are assumed to intensify their proximity-seeking efforts and persistently pursue excessive closeness with the attachment figure. *Avoidant* individuals, on the other hand, are expected to inhibit the expression of proximity seeking as a means to maintain autonomy and interpersonal distance, especially in the context of distress. Most of the evidence stemming from self-report and behavioural observation studies could confirm the predicted behavioural responses associated with secure and avoidant attachment (e.g., Carnelley, Pietromonaco, & Jaffe, 1996; Fraley & Shaver, 1998; Simpson, et al., 1992). However, no support was found for the assumed heightened proximity-seeking behaviour in anxious individuals, although it has been demonstrated that attachment anxiety does relate to proximity goals (e.g., Gillath, et al., 2006). In order to explain this discrepancy, we believe it is useful to make a distinction between the level of action tendencies and the level of actual behaviour, an idea that stems from the approach-avoidance motivation literature (see Carver & Scheier, 1981, 1998; Carver, 2006; Elliot, 2006). In fact, integrating this literature with current ideas on attachment may be most interesting from both a theoretical and empirical point of view.

It is generally assumed that behaviour is built from two distinct kinds of action tendencies, namely approach and avoidance, which are driven by approach and avoidance goals. Approach goals are desirable conditions that people wish to attain, which motivates regulatory efforts to reduce the

discrepancy between one's current and desired goal-state. Avoidance goals, on the other hand, are undesirable conditions that people wish to evade (i.e., 'anti-goals'), which facilitates discrepancy-enlarging loops. The idea that behaviour is driven by approach and avoidance goals is inherently present in the model on attachment system functioning. That is, proximity seeking can be conceptualized as a goal-directed action tendency aimed at reducing the discrepancy between one's actual (i.e., distress, insecurity) and desired (i.e., security) state. Within this motivational view, attachment anxiety would be characterized by approach goals that drive approach tendencies oriented towards the attachment figure, whereas attachment avoidance would be driven by avoidance tendencies away from the attachment figure. These action tendencies are likely to operate automatically and may or may not be translated directly into overt behavioural responses. That is, several other competing goals (and resulting appraisals) may obscure the relation between action tendencies and actual behaviour. Hence, in order to gain deeper insight into the behavioural responses associated with different attachment styles, it is most important to focus not only on behaviour, but also on its proximal determinants, namely goals and action tendencies.

Identifying individual differences in plans and action tendencies that operate at the automatic level requires the use of experimental paradigms. Other measures such as self-report and behavioural observation are less suitable for assessing automatic behavioural tendencies. As described earlier, self-report questionnaires are unable to measure behavioural responses at the process-level, but can tap only into the outcome of a certain process. Furthermore, the observation of behaviour may also impose a constraint on the study of automatic action tendencies because the actual manifestation of behaviour is likely to be determined by both controlled and automatic processes. Hence, in order to draw firm conclusions on the presumed automatic nature of proximity-seeking tendencies, it is essential to study these behavioural strategies under conditions of automaticity whereby the likelihood that controlled processes influence the outcome are reduced at minimum.

ATTACHMENT REPRESENTATIONS

Attachment-Related Goals

As already described in the previous section, goals are an integral part of attachment working models. During the past decades, motivational research has shown that goals are cognitive structures representing the desired end-state that people want to attain. Such mental representations can be activated without conscious intention, thus automatically (e.g., Bargh, 1990; Bargh et al., 2001; Ferguson, et al., 2007). Given that goals provide an orienting framework for the direction of cognitive resources and behaviour (e.g., Srull, & Wyer, 1986), it is likely that goals play a key role in the regulation of attachment-related affect. Hence, in order to understand the underlying source of the attentional patterns, appraisals, distress-reactions, and proximity behaviour associated with attachment-style differences, it is essential to examine the goals that drive these attachment processes.

In the case of the attachment system, several goal-states can be delineated including security, self-protection, proximity, independence, distance, etc. Given that these goals have been developed in light of past attachment experiences, important attachment-style differences can be expected in the goal-representations associated with attachment working models. Attachment theory predicts that *secure* individuals desire intimate attachment relationships and seek a balance between closeness and autonomy. *Anxious* individuals also desire intimate relationships, but their negative self-view and their additional need for approval may lead them to seek extreme levels of closeness and lower levels of autonomy. *Avoidant* individuals, on the other hand, are assumed to limit intimacy and pursue self-protective motives such as self-reliance, independence and (emotional/physical) distance. Given the safety-regulation function of the attachment system, both secure and insecure attachment strategies are primarily driven by the overarching goal of felt-security. As such, goals exist in a goal-hierarchy, in which security functions as a higher-level goal that can be attained through the pursuit of lower-level or sub-goals. Normatively, security will be attained through seeking proximity towards the attachment figure. However, because insecure individuals have repeatedly experienced that proximity goals and their associated action tendencies failed in achieving security, they needed to

reorganize their value-system. In this context, Carver and Scheier (1998) have suggested that, in the face of adversity, people are likely to interrupt their behaviour and assess the likelihood of attaining the goal, which is based on retrieving 'chronic expectancies' from memory. If the expectancies towards success are sufficiently positive ('hope'), one will continue pursuing the goal. However, if one has negative expectations, one is likely to withdraw from goal-pursuit. Applied to attachment differences, it appears that avoidant individuals have disengaged from proximity goals and adopted alternative goals (i.e., distance and independence) to achieve security. Anxious individuals, in contrast, hold on to proximity goals, which would imply that they have positive expectancies regarding goal-attainment. However, it is equally plausible to assume that anxious individuals do hold pessimistic appraisals of goal-pursuit, but stay committed to the (unattainable) goal because they have no alternative to achieve security due to their sense of self as weak and vulnerable. This variation in how people attempt to achieve felt security may arise from differences in social learning histories (cfr. supra). Given that avoidant individuals have repeatedly experienced rejection in the past, they have learned to suppress their proximity-seeking efforts. As a result, they are less sensitive to positive outcomes and place less value at attachment needs, because they are chronically concerned with reducing their fear of intimacy and maintaining their well-practiced defences (Pietromonaco & Barrett, 2000). Attachment anxiety, in contrast, would originate from a history of inconsistent, and thus sometimes positive, responses from their attachment figure. Given that their proximity-seeking efforts are sometimes successful in attaining security, proximity goals have been acquired based on a partial reinforcement schedule which makes them insensitive to extinction

Of particular interest are the anxious and avoidant patterns of attachment which are thought to reflect opposing strategies for regulating emotions and behaviour. The above overview makes clear that the working models associated with attachment anxiety and avoidance include opposite goals (i.e., proximity versus distance goals) that are likely to result in opposite cognitive, affective, and behavioural responses. Although there is little empirical work that directly assesses the goal-structures associated with attachment anxiety and avoidance, a few studies point to some important patterns. Research has confirmed that attachment avoidance is indeed associated with the pursuit of distance and

personal control, whereas attachment anxiety is related to proximity and security goals (e.g., Carnelley, Pietromonaco, & Jaffe, 1996; Rom & Mikulincer, 2003). There is also evidence demonstrating that attachment-related goals can be activated automatically (e.g., Baldwin et al., 1993; Gillath et al., 2006; Mikulincer, 1998a). Nevertheless, most of the research on automatic attachment goals did not tap directly into the specific goal-representations that promote or inhibit proximity behaviour, but rather focused on the automatic activation of goal-related knowledge in response to particular contexts and/or measured the *accessibility* of goals (as inferred from the lexical decision times to identify goal-related words). More empirical research is thus needed that directly assesses the implicit motivational constructs associated with attachment style-differences. To address this need for additional research, the Implicit Association Test could be a useful tool for examining the automatic pursuit and evaluation of proximity and distance goals as mental representations of desired end-states, which are stored in attachment working models.

Attachment-Related Self-Representations

According to the original writings of Bolwby (1969), knowledge about the self and others constitute one of the most important components of attachment working models. Such beliefs stem from past attachment experiences and play a crucial role in guiding emotional appraisals and shaping attachment behaviour. Research on this topic is thus of central theoretical relevance. Recall that because attachment *security* has evolved from repeated interactions with an available, caring, and supportive attachment figure, these individuals are expected to perceive themselves as worthy of love and others as available and reliable. Insecure individuals, on the other hand, have experienced frustrating interactions with an unavailable, inconsistent, or rejecting attachment figure, which is assumed to result in the development of vulnerable and unstable self- and other-evaluations that are contingent on relationship-experiences and strongly influenced by defensive, distorting biases (Mikulincer & Shaver, 2007). *Anxious* individuals are believed to have intense doubts about their own self-worth, lovability and competence, and would hold negative or rather ambivalent appraisals of their attachment figure. *Avoidant* individuals, on the other hand, are

assumed to perceive themselves as self-competent and self-efficient, and would hold negative beliefs about others' traits and intentions.

At present, a large body of evidence stemming from self-report studies has provided (partial) support for the predicted associations between attachment styles and global positive and negative self- and other-views (e.g., Griffin & Bartholomew, 1994, Collins & Read, 1994; for an overview, see Mikulincer & Shaver, 2007). However, because people are especially prone to make biased and self-protective judgements when evaluating themselves and others (e.g., Greenwald & Banaji, 1995), and because working models are likely to exert an automatic influence on these judgements (e.g., Collins et al., 2004), attachment researchers have started to rely on implicit measures to explore whether attachment style-differences relate to implicit evaluations of self and others. Using the lexical decision task and emotional Stroop task, these studies have revealed the important information that self-representations may vary across context and level of responding, especially in the case of attachment avoidance (see Mikulincer, 1995, 1998b; Mikulincer, et al., 2004). The main conclusion of these studies was that the positive self-view of avoidant individuals should be regarded as less stable and less authentic than that of secure individuals, and should be interpreted as a defensive and strategic attempt to convince others of their competence and self-efficacy (Mikulincer, 1998b). The fact that implicit measures were able to reveal unique and valuable information on the defensive nature of avoidant individuals' self-view encourages further use of those measures in research on attachment-related constructs.

Even though response-latency paradigms, such as the lexical decision task and emotional Stroop, have proven to be useful for examining the implicit features of working models, they do not allow one to tap directly into the automatic positive or negative *evaluations* associated with self and others. For this purpose, affective priming techniques may be better suited. However, previous research using such techniques failed to find significant (or theoretically expected) differences in automatic attitudes towards significant others (Banse, 1999, 2001). Another tool that could be useful for investigating attachment-differences in self- and other-evaluations is the Implicit Association Test. The latter has proven to be a valid measure of implicit self-esteem (Greenwald & Farnham, 2000) and has shown to be more reliable for assessing individual differences than most other implicit measures (e.g., Bosson, Swann, &

Pennebaker, 2000). In recent studies, Zayas and Shoda (2005) and Banse and Kowalick (2007) did indeed demonstrate that the IAT is able to capture attachment-related differences in automatic reactions towards the attachment figure. More precisely, both studies showed that securely attached individuals (as measured by the RQ) automatically associate their attachment figure with a more positive evaluation. In addition, the results of Zayas and Shoda also revealed a significant association between attachment avoidance (as measured with the ECR) and a more negative implicit evaluation of the attachment figure. Importantly, the Zayas and Shoda study also measured automatic self-evaluations. However, they failed to find a significant relationship with attachment style.

Although the IAT and other implicit measures hold promise for investigating implicit beliefs in the context of attachment, current research on automatic self- and other-evaluations is limited in important ways. More specifically, most of the studies to date did not create the right conditions in terms of situational context and stimulus material. More research is thus needed to further explore the role of implicit self- and other-beliefs in attachment system functioning. The study presented in this dissertation took a first step in this endeavour by focusing specifically on the implicit attachment self-concept, as measured by the IAT, and its relation with individual differences in attachment style. Drawing more closely on the original predictions of attachment theory and current (social-cognitive) ideas on the self-concept, we aimed at providing a more direct test of attachment-related differences in implicit self-evaluations.

OVERVIEW OF THE PRESENT RESEARCH

Because more direct tests are needed to investigate implicit attachment-related representations and automatic cognitive-motivational processes, we have conducted a series of studies exploring attachment-style differences in attention, action tendencies, goals, and self-representations. These studies have been subdivided into two main parts.

In the first part of this dissertation, we present four chapters that examine the influence of attachment working models on automatic attachment processes. Chapters 1 to 3 investigated attachment-related differences in attentional

processing and Chapter 4 focused specifically on automatic action tendencies. The above literature-review suggests that selective attention to relationship-relevant information plays a crucial role in the activation and regulation of the attachment system and has important implications for emotional functioning in close relationships. Yet, little research has thus far been conducted in this area. Therefore, the first series of studies reported in this dissertation examined the role of selective attention as a strategy for regulating attachment-related distress and proximity to the attachment figure. In **Chapter 1**, we examined the relation between individual differences in attachment style and selective attention to threat, using a dot-probe task presenting (attachment-related and general) positive and threatening words. In a related study, which is presented in **Chapter 2**, we aimed at replicating and extending the results of Chapter 1 using more potent threat cues, namely pictures of emotional face expressions, and another attentional task, namely an emotional modification of the exogenous cueing task. In **Chapter 3**, four experiments are reported that investigated the role of attention in regulating (psychological) proximity towards the attachment figure, using a dot-probe task in which the names of the participant, the attachment figure, an acquaintance, and a neutral person were presented. In addition to investigating proximity seeking at the cognitive level, the present research was also interested in investigating this central regulatory process at the behavioural level. To better understand attachment-related behavioural responses, we argued that it may be useful to conceptualize proximity seeking as an automatic approach-avoidance tendency. In **Chapter 4**, we present two studies in which we investigated the relation between individual differences in attachment style and automatic approach-avoidance tendencies. For this purpose, we adopted an approach-avoidance SRC task in which participants made symbolic approach and avoidance movements towards or away from attachment figure- and acquaintance-related cues.

In the second part of this dissertation, two chapters are presented that explore attachment-style differences in automatically activated attachment-related representations. The existing literature suggests that adults with different attachment styles differ in the content of their working models. So far, most of the research on this topic has relied on explicit, self-report measures. However, in the literature-review reported above, we have provided several theoretical and

empirical reasons for measuring both implicit and explicit features of working models. More research is thus needed that directly assesses *implicit* attachment representations. Because goals and self-representations are central components of the attachment behavioural system, this research project focused on these specific representations and investigated their relation with individual differences in attachment style. **Chapter 5** documents three studies that aimed at tapping into the behavioural goals underlying attachment anxiety and avoidance, namely proximity and distance, and measured these goals both at the implicit (using the IAT) and explicit level (using self-report questionnaires). The study reported in **Chapter 6** focused on attachment-style differences in the implicit attachment self-concept. We adapted the design of a previous study on implicit self-evaluations using the IAT, in an attempt to increase the validity of this task as a tool for investigating attachment working models.

The various chapters presented in this dissertation are an exact copy of the original manuscripts. The dissertation ends with a general discussion of the presented research, in which our most relevant findings will be summarized and discussed in terms of their theoretical implications. Finally, we point to the limitations of our work and formulate a number of guidelines for future research.

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PART I

ATTACHMENT PROCESSES

CHAPTER 1

ATTENTIVE PROCESSING OF THREAT AND ADULT ATTACHMENT: A DOT-PROBE STUDY[1]

ABSTRACT

In the present study, we examined selective attention for emotional word stimuli as a function of individual differences in attachment style. Participants completed a dot-probe task in which a general threat, attachment-related threat, general positive, or attachment-related positive word was presented together with a neutral word. Results showed that attachment anxiety and avoidance were associated with an attentional bias away from attachment threat words. This attentional avoidance effect was best predicted by the interaction between attachment anxiety and avoidance, and not by their unique main effects. The findings are discussed in relation to attachment theory and the general literature on attentional biases.

INTRODUCTION

An important assumption of attachment theory is that early attachment experiences translate into mental representations of self and others, which have been related to many essential intra- and interpersonal processes (see Pietromonaco & Barret, 2000). These 'working models' can be regarded as cognitive schemas that provide an orienting framework for directing cognitive, emotional, and behavioural responses throughout the lifespan. Recent developments in attachment research have pointed to the crucial role of attachment in affect regulation and cognitive functioning through the selective processing of attachment-relevant information (Mikulincer & Shaver, 2003). In relation to this, it has been argued that selective attention represents a key strategy for the activation and regulation of the attachment system and that individuals differ in their ability to regulate attention to emotional stimuli as a function of existing goals, beliefs, and expectations (Main, Kaplan, & Cassidy, 1985). Furthermore, the attachment literature suggests that insecure attachment orientations are characterized and maintained in part by attentional biases. Few empirical studies to date have, however, examined attention in the context of attachment, despite the theoretical importance of this regulatory process. The present study was therefore designed to investigate the impact of mental representations of attachment on selective attention to threatening information. We start by presenting the main assumptions on the role of attention in attachment system functioning.

Attachment Theory

In his seminal work on attachment, Bowlby (1969, 1973, 1980, 1982) proposed that both children and adults have an innate attachment behavioural system that is manifested in seeking proximity to the attachment figure in times of need. He postulated that threatening stimuli are highly potent cues for activating the attachment system and that internal working models of attachment filter incoming, potentially threatening information by directing attention towards schema-congruent material (Mikulincer & Shaver, 2003). In addition to the selection of incoming information, attentional factors have also been linked to the regulation of the attachment system (Main, 1990). That is, by actively

orienting to or avoiding attachment-relevant information, one can magnify or reduce emotional experiences.

Beyond describing the normative aspects of the attachment system, Bowlby (1973) also delineated individual differences in the functioning of the system, which can be traced back to early attachment experiences. When faced with threat, people seek for protection and support from the attachment figure. If these bids for care and protection are successfully met, a sense of security and safety will be attained, encouraging an open mind-set to explore the environment. This is part of the primary attachment strategy and is characteristic of securely attached individuals. However, when the attachment figure is perceived as being unavailable or unresponsive to one's needs, no distress alleviation will be experienced and people will adopt alternative strategies for dealing with distress. This may result in so-called hyperactivation or deactivation of the attachment system (Main, 1990) which corresponds with attachment anxiety and avoidance respectively (Brennan, Clark, & Shaver, 1998). Hyperactivating strategies are characterized by an excessive desire for closeness, preoccupation with cues of attachment figure unavailability, amplification of threat appraisals, vigilance to distress cues, and mental rumination on negative emotions. These strategies may lead to a chronic activation of the attachment system and are a distinctive feature of attachment anxiety. Deactivating strategies, on the other hand, are characteristic of attachment avoidance and aim at down-regulating the attachment system by inhibiting attachment needs, diverting attention away from distress cues, and emphasizing a sense of self-reliance in coping with distress. Basically, these strategies involve suppression and repression of any emotion or thought that may cause unwanted activation of the attachment system (i.e., especially threat- and attachment cues) (Fraley & Shaver, 2000; Mikulincer & Shaver, 2003).

From this perspective, attachment working models can be viewed as providing organizational rules that guide responses to distress. Accordingly, important attachment-style differences can be expected in the way in which threatening information is processed.

Attachment and Attention

Evidence on the relation between attachment representations and attention allocation primarily stems from research into child attachment. Although attachment theory clearly predicts vigilance to threat in anxious individuals and avoidance of threat in avoidant individuals, research has demonstrated that, in a distressing separation context, anxiously as well as avoidantly attached children look away from attachment-related pictures (Main, et al., 1985). In another study, selective attentional processing was examined using two simultaneously presented drawings depicting attachment-relevant positive information and attachment-irrelevant neutral information. The results of this study indicated that both anxiously and avoidantly attached children direct attention away from attachment-related information (Kirsh & Cassidy, 1997). Interestingly, when varying the valence of the pictures (i.e., attachment-related positive, neutral, and threatening pictures), it was shown that only avoidant children direct attention away from both positive and negative pictures (Kirsh & Cassidy, 1997). No significant attentional bias effects were found in the other attachment groups. In general, the aforementioned studies revealed that insecurely attached children process threatening information differently from secure children. However, no evidence was found for differential attentional processing as a function of the specific type of attachment insecurity (i.e., anxious versus avoidant).

In the context of adult attachment, one prior study directly investigated attachment-style differences in selective attention for threatening, positive, and neutral stimuli (Zeijlmans Van Emmichoven, Van Ijzendoorn, deRuiter, & Brosschot, 2003). Attentional bias was measured by an emotional Stroop task that was administered in a sample of anxiety disordered patients and a non-clinical sample. In broad strokes, it was found that securely attached anxiety disordered patients showed a larger Stroop interference effect on threat words than insecure (anxious as well as avoidant) patients. This led the authors to conclude that secure individuals are more open to process threatening information than insecure patients, who seem to ignore or avoid the threatening nature of the word stimuli. In the non-clinical group, insecure participants showed slower response latencies than secure ones, but none of the two attachment groups showed specific interference effects. As in child research, the findings on attention in adults could not confirm theoretical predictions, but

rather indicated a general effect of attachment security versus insecurity on attentional processing.

One important reason for the absence of specific Stroop effects in the non-clinical group may be that the stimuli used in the research of Zeijlmans Van Emmichoven (2003) were general threat words that did not refer to specific attachment-related concerns. According to Beck's view on cognitive processing (Beck, 1976; Beck, Emery, & Greenberg, 1985), attention allocation is related to the specific content of the stimuli, indicating that people preferentially process information that is personally relevant and schema-congruent. A second remark on the aforementioned study concerns the use of the emotional Stroop task as a measure of attention allocation. Researchers have noted several interpretive difficulties with the Stroop task (summarized by Mogg et al., 2000). Most importantly, it has been argued that the Stroop-effect does not reflect attention, but arises from other factors such as interruption effects or task-irrelevant processes (e.g., de Ruiter & Brosschot, 1994). Moreover, it has been suggested that interference occurs at the level of response generation rather than attention allocation (Rosenfeld & Skogsberg, 2006). As such, interference in the Stroop task may indicate either vigilance towards threat or avoidance of threat, a distinction that could be crucial in investigating attentional biases as a function of attachment style. Therefore, it is useful to look for other paradigms that provide a less ambiguous measure of attentional processing, such as for example the dot-probe task (see Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & Van Ijzendoorn, 2007, for a review of differences between the Stroop and dot probe task). A final remark on the study of Zeijlmans Van Emmichoven and colleagues concerns the fact that they adopted a categorical approach to measure individual differences in attachment. By classifying participants into attachment categories, this study can provide only partial information on attentional processing in the context of attachment, because the use of categories does not allow one to examine possible interaction effects between anxiety and avoidance. Furthermore, because data were collapsed across insecure individuals, the independent contribution of attachment anxiety and avoidance could not be determined. In addition, Zeijlmans Van Emmichoven and colleagues adopted a developmental approach to attachment research by using the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) to assess individual differences in attachment style. The AAI focuses on attachment

representations, defensive strategies, and discourse properties and has been designed to measure working models of early child-parent relationships, not adult close relationships. Accordingly, the narrative approach on attachment-style differences clearly differs from self-report measures of attachment, both in the conceptual and empirical sense (Shaver & Mikulincer, 2002). To our knowledge, no study to date has investigated the relation between attentional processing of threat stimuli and attachment style as measured by a self-report questionnaire.

The Present Study

Taking into account the above remarks, we investigated selective attention for general as well as attachment-related threat words as a function of attachment style. We also included positive words in order to examine whether selective attention for threat would be specific to negative stimuli or would operate for emotional stimuli (i.e., positive and negative) in general. Attention for these words was examined using the dot-probe paradigm (MacLeod, Mathews, & Tata, 1986). On each trial, two words (one relevant, one neutral) were presented simultaneously at two different spatial locations on the screen. Immediately after these stimuli have been removed from the screen, a small dot probe appeared at the position of one of the two stimuli and participants were asked to respond as quickly as possible to the location of the dot. Responding on trials where a probe was presented at the same location as a relevant (i.e., non-neutral) word ("congruent" trial) was compared with responding on trials where a probe was presented at the opposite location of a relevant word ("incongruent" trial). If individuals selectively attend to words of a particular category, responses will be faster when the probe follows at the location previously occupied by words from this category.

The Experiences in Close Relationships Scale-revised (ECR-revised; Fraley, Waller & Brennan, 2000) was used to measure the two dimensions assumed to underlie individual differences in attachment, namely attachment anxiety and avoidance. This questionnaire has been developed in light of the dimensional view on attachment and provides for each participant a score on both attachment dimensions, which allows for testing the joint effect of attachment anxiety and avoidance on attention allocation. Importantly, no study to date has found the

predicted vigilance-effect in anxiously attached individuals. Instead, research has shown that anxious individuals display the same attentional pattern as avoidant individuals. In relation to this, it is possible that the previously observed attentional avoidance-effect in insecure individuals is qualified by an interaction effect between attachment anxiety and avoidance. In previous studies on attachment and attention (e.g. Kirsch & Cassidy, 1997; Zeijlmans van Emmichoven, 2003), this hypothesis could not be examined because participants were classified into one of three or four mutually exclusive attachment categories. We argue that in order to better understand the dynamic functioning of the attachment system, it is necessary to investigate how the two attachment dimensions of anxiety and avoidance operate in interaction with each other.

Hypotheses

Hypotheses from attachment theory are relatively straightforward: Attachment anxiety is assumed to be associated with an attentional bias towards (general as well as attachment-related) threatening information, whereas attachment avoidance would be associated with an attentional bias away from threat. On the other hand, because previous research has demonstrated that both attachment anxiety and avoidance are related to attentional avoidance of threat, it can also be expected that anxiety and avoidance will show a similar pattern of attentional responding. In the present study, we examined this differential prediction. In addition, we explored whether selective attention to threat is an interactive function of both attachment anxiety and avoidance.

METHOD

Participants

Thirty-nine first year psychology students (32 women, 7 men) participated in the experiment as a part of their course requirements.

Materials and Procedure

The stimulus material for the dot probe task consisted of 5 categories of words: 8 general threat words (e.g., death, dangerous, painful), 8 attachment-

related threat words (e.g., separation, rejected, ignored), 8 general positive words (e.g., health, happy, satisfied), 8 attachment-related positive words (e.g., proximity, security, supporting) and 32 neutral words (e.g., furniture, universe, balanced). These words were drawn from attachment literature and previous research on anxiety-related attentional biases (e.g., Fox, 1993; Mogg, Bradley, Mathews, & Williams, 1993, 1995). Each word was paired with a neutral word, matched for both length and frequency (Hermans & De Houwer, 1994), to create 32 critical word pairs. Another set of 64 neutral words were paired to create 32 filler trials. The stimuli were presented in black uppercase letters in an Arial font with a font size of 38. The probe detection task was programmed and presented using the INQUISIT Milliseconds software package (INQUISIT 2.01, 2005) on a Pentium II computer with a 15-inch colour monitor.

Attachment style was measured using a Dutch translation of the ECR-revised (Fraley, et al., 2000; ECR-R-NL, Buysse & Dewitte, 2004). This questionnaire contains 36 statements that refer to anxiety and avoidance in attachment relationships. Two attachment scores were computed by averaging the items on the two subscales of anxiety and avoidance. This questionnaire has proven to be internally consistent and adequate in terms of construct validity (Brennan et al., 1998). In the current sample, Cronbach's alphas were high for the Anxiety subscale ($\alpha = .92$) as well as for the Avoidance subscale ($\alpha = .89$). As recommended, we asked our participants to fill in the questionnaire while holding their primary attachment figure in mind.

Procedure. After signing an informed consent form, participants were seated behind the computer at a distance of approximately 60 cm from the screen. Instructions on the computer screen informed them that they would perform a dot detection task. The task began with 10 practice trials, followed by 192 test trials. Each trial started with a fixation cross that was presented for 500 ms in the middle of the screen. Then, a word pair appeared that remained visible for 500 ms. Words in each pair were presented one above the other at a distance of 5 cm above and below the centre of the screen. As the word pairs disappeared, a small dot-probe (5 mm diameter) replaced one of the two words and remained on the screen until participants responded. Participants had to indicate the probe location by pressing one of two buttons as quickly and accurately as possible on a standard AZERTY-keyboard: the Q key with the left index finger when the

probe was presented at the upper location and the M key with the right index finger when the probe was presented at the lower location. Word pairs were presented in fully randomized order across trials and participants. The words as well as the dot probe were presented equally often at the top or bottom position of the screen, and the dot-probe was equally likely to replace either a relevant or a neutral word. Each trial type was presented four times and the inter-trial interval was set to 500 ms. The self-report questionnaires were administered after the dot-probe task.

RESULTS

Latencies from trials with errors were removed (less than 3 % in each condition) as well as reaction times (RTs) shorter than 200 ms or longer than 2000 ms, which were considered as outliers. In addition, probe detection latencies that were three standard deviations above or below the individual mean were also excluded from statistical analyses (also see Koster, Crombez, Verschuere, & De Houwer, 2004).

Table 1

Mean reaction times (in ms) and standard deviations of target responses in the dot probe task as a function of trial type and congruency

Trial type	Congruency	*M*	*SD*
General threat	Congruent	365	49
	Incongruent	363	42
Attachment-related threat	Congruent	368	47
	Incongruent	363	44
General positive	Congruent	364	44
	Incongruent	367	46
Attachment positive	Congruent	363	48
	Incongruent	365	45

Mean response latencies for each trial type are presented in Table 1. The reaction times on the dot-probe task were analysed using a 4 (*Valence*: general threat, attachment threat, general positive and attachment positive) x 2 (*Congruency*: congruent, incongruent) repeated measures ANOVA. This analysis revealed no significant effects (all *F*s < 1), suggesting that, overall, participants did not preferentially allocate attention towards certain stimulus categories.

Next, we investigated the correlations between anxious and avoidant attachment and the four attentional bias scores (general threat, attachment threat, general positive and attachment positive). The attentional bias scores were calculated by subtracting the average detection time on congruent trials from the average detection time on incongruent trials (see Mogg, Millar, & Bradley, 2000). Table 2 shows that attachment anxiety as well as attachment avoidance correlated significantly and negatively with the attentional bias score for attachment threat. Furthermore, the correlation between attachment anxiety and the attentional bias for general threat words almost reached significance. None of the other correlations were significant (all *p*s >.10).

Table 2

Correlations between attentional bias and attachment dimensions as a function of trial type

	Attachment anxiety	Attachment avoidance
General threat	-.31*	-.16
Attachment threat	-.41**	-.40**
General positive	.24	.10
Attachment positive	.25	.19

* *p* < .10, ** *p* ≤ .01

The relation between attachment styles and selective attention was further analysed using a regression approach. Hierarchical regressions were performed, entering the four attentional bias scores as dependent variables and the two attachment dimensions (anxiety and avoidance) and their interaction term as

predictor variables. In a first step, attachment anxiety and attachment avoidance were entered as predictors and their unique main effects on attention were examined. In a second step, the multiplicative product of attachment anxiety and avoidance was entered to asses the effect of their interaction while controlling for their main effects. Because the anxiety and avoidance subscales of the ECR-R were significantly correlated ($r = .42$, $p < .01$), the predictor variables were centred around their respective means to reduce possible problems of multicollinearity (see Aiken & West, 1991).

Only the regressions on the attentional bias index for *attachment threat* words revealed significant effects, $F(3, 38) = 5.63$; $p < .01$. Specifically, the interaction term between attachment anxiety and attachment avoidance significantly predicted attentional avoidance of attachment-related threat words, $\beta = -.32$, $t(38) = -2.22$, $p < .05$.[2] Although the model with the two attachment dimensions as unique predictors revealed an overall significant effect, $F (2, 38) = 5.39$, $p < .01$, the unique main effects of attachment anxiety ($\beta = - .29$; $p = .08$) and avoidance ($\beta = -.28$; $p = .09$) were only marginally significant predictors of selective avoidance of attachment threat words. In a post hoc probing procedure, the statistically significant interaction was interpreted by plotting regression lines for high and low values on both attachment dimensions (Aiken & West, 1991; Holmbeck, 2002). That is, we tested whether the association between attachment anxiety and attentional avoidance of attachment threat words would be conditional on the values of attachment avoidance and vice versa, which corresponds to conducting a moderation analysis (see Baron & Kenny, 1986). First, we plotted regression lines for high (+1 *SD* above the mean) and low (-1 *SD* above the mean) values of attachment avoidance (see Figure 1). Significance tests for slopes indicated that only the simple slope for the High avoidance regression line ($\beta = -.65$, $p < .01$) was significant. The simple slope for the Low avoidance regression line ($\beta = .08$, $p > .10$) was not significant. This suggests that attachment anxiety is significantly associated with attentional avoidance of

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[2] We also tested for the specificity of these effects by repeating the regression analyses on the attentional bias scores and adding trait anxiety – as measured by the STAI (Spielberger et al., 1983) – as an extra predictor variable beyond attachment anxiety, avoidance, and their interaction term. This analysis revealed no significant main effect of trait anxiety in predicting attention to attachment threat, $\beta = .08$; $p > .10$, suggesting that trait anxiety cannot account for the observed effects.

attachment threat, only in interaction with high scores on attachment avoidance. As we already reported above, the interaction term between the predictor (i.e., attachment anxiety) and the moderator variable (i.e., attachment avoidance) was statistically significant, indicating that the two simple slopes for low and high values of attachment avoidance were significantly different from one another.

Fig. 1. Attentional bias for attachment threat as a function of attachment anxiety and avoidance, with attachment avoidance as moderator variable
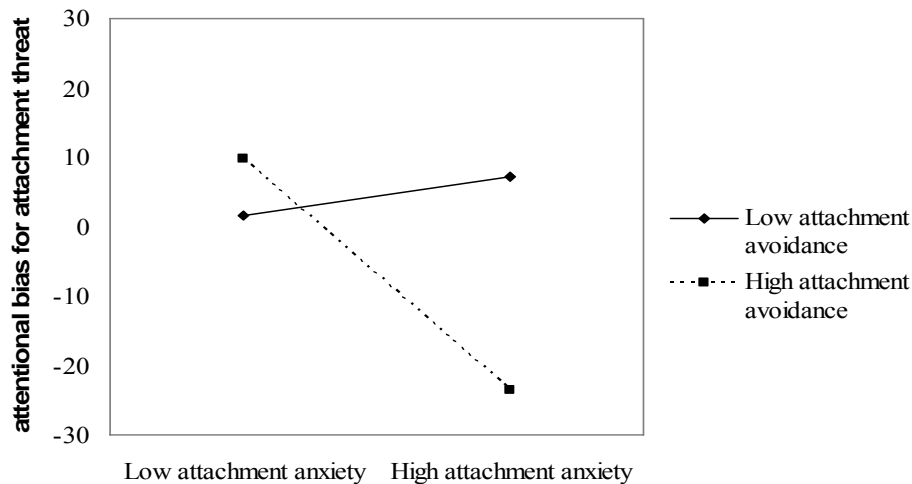

We repeated these analyses, but this time with attachment anxiety as the moderator variable (see Figure 2). Significance tests for slopes indicated that only the simple slope for the High anxiety regression line ($\beta = -.57$, $p < .01$) was significant. The simple slope for the Low anxiety regression line ($\beta = .16$, $p > .10$) was not significant. This suggests that attachment avoidance is significantly associated with attentional avoidance of attachment threat, only in interaction with high scores on attachment anxiety. Again, because the interaction term between the predictor (i.e., attachment avoidance) and the moderator variable (i.e., attachment anxiety) was statistically significant, one can conclude that the two simple slopes for low and high values of attachment anxiety were significantly different from one another.

The regressions on the attentional bias index for *general threat* stimuli as a dependent variable revealed no significant unique or interactive effects of

attachment anxiety and avoidance, $F(2, 38) = 1.90$, $p > .10$ and $F(3, 38) = 1.80$, $p > .10$ respectively. Similarly, no significant unique or interactive effects of attachment anxiety and avoidance were found for the attentional bias indices for *general positive* and *attachment positive* words (all Fs < 1.5).

Fig. 2. Attentional bias for attachment threat as a function of attachment anxiety and avoidance, with attachment anxiety as moderator variable
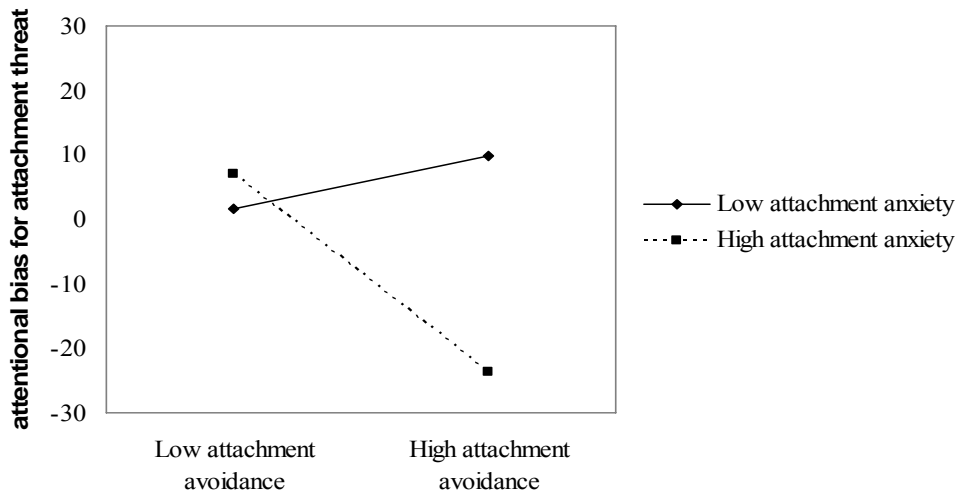
DISCUSSION

In the present study, we examined selective attention to threat stimuli as a function of adult attachment style. More specifically, we examined the main and interactive effects of attachment anxiety and avoidance on attention for positive and negative attachment-related and attachment-unrelated words. We found that (1) attachment anxiety and avoidance were associated with an attentional bias away from negative attachment-related words, (2) the best predictor of this attentional avoidance effect was the interaction between attachment anxiety and avoidance, and (3) the attentional avoidance effect was specific to attachment-related threat words. We will discuss each of these effects below.

Attachment theory predicts clear differentiated patterns of attention in anxious and avoidant individuals: High anxious individuals are assumed to be

hypervigilant to threat cues, whereas avoidant individuals are assumed to avert their attention away from threat (Mikulincer & Shaver, 2003). However, studies on attachment and attention in children and adults have largely failed to support these predictions (Kirsch & Cassidy, 1997; Main et al., 1985; Zeijlmans Van Emmichoven et al., 2003). In line with these previous studies, our data showed that attachment anxiety and avoidance yield similar response patterns in attentional processing, namely attentional avoidance of attachment threat. Our results were thus not compatible with theoretical predictions on attentional processing of attachment-related threat.

Instead, multiple regressions showed that attentional avoidance of attachment-related threat was best predicted by the interaction between anxiety and avoidance. Whereas previous studies looked only at the main effects of anxiety and avoidance (or the effect of secure versus insecure) and found that both anxious *and* avoidant individuals display attentional avoidance, the present study provided important new information on this issue. We adopted a dimensional approach, which enabled us to test the joint effect of the two attachment dimensions on selective attention. The results of our slope analyses revealed that specifically the combination of high attachment anxiety and high attachment avoidance is associated with an avoidant attentional style.

An explanation for this finding could be found in the work of Bartholomew (1990). She noticed that the avoidant pattern of attachment conflates two distinct forms of avoidance, namely fearful-avoidance and dismissive-avoidance. Fearful attached individuals display an avoidant pattern of attachment in combination with high levels of anxiety. Such individuals are assumed to avoid attachment-related information out of fear for the negative consequences of attachment (e.g., rejection, hurt). Hence, averting attention away from attachment threat stimuli might be a strategic attempt to alleviate the anxious mood state elicited by the aversive stimuli and thereby protecting themselves from painful memories of past attachment experiences (Main & Hesse, 1990). The latter idea bears many similarities with the vigilance-avoidance hypothesis that has been proposed in studies on trait anxiety. This theory holds that early vigilance to threat is followed by strategic avoidance of threat as a means to reduce subjective distress (Mogg & Bradley, 1998).

It is noteworthy that no study to date has found evidence that anxiously attached individuals turn their attention towards (general or attachment-related)

threat. Given that vigilance to threat is an important prediction of attachment theory, this null finding should be explored further. Drawing on the idea that attentional vigilance occurs in early, automatic stages of processing (see Mogg & Bradley, 1998), it is possible that the expected attentional bias effect in anxiously attached individuals will be apparent only when stimuli are presented at shorter stimulus durations. This hypothesis could be tested by examining the time-course of attention to threat (see Koster, Verschuere, Crombez, & Van Damme, 2005; Mogg, Bradley, Miles, & Dixon, 2004).

A closer look at the regression slopes also revealed that the low anxiety and low avoidance regression lines were both non-significant with regard to selective attention for attachment threat. This seems to suggest that low anxious-low avoidant (i.e., secure) individuals do not preferentially allocate attention towards attachment threat, in contrast with high anxious and high avoidant individuals who show an avoidant pattern of attention. Subsequent analyses further supported the idea that insecure individuals limit attention to threatening words. That is, when dividing our sample in a secure-insecure group (based on a median split), an independent sample *t*-test on the attentional bias index for attachment threat yielded a significant difference between secure and insecure participants, with insecure ones being avoidant of attachment threat. This is consistent with previous research demonstrating differential attentional processing as a function of secure versus insecure attachment (Kirsh & Cassidy, 1997; Zeijlmans Van Emmichoven et al., 2003).

In the present study, attentional bias effects emerged only for attachment-related threat words. No attentional effects were found for general threat words or positive information. These results are compatible with Beck's content-specificity hypothesis (1976) stating that attentional biases are most likely to occur for stimuli that are consistent with the cognitive schemas that occupy the individual's mind. Hence, the inclusion of stimuli that explicitly refer to an attachment-related content appears essential for investigating selective information processing as a function of attachment. Another explanation for the absence of selective attention to general threat words could be that the word stimuli used in the present study did not elicit sufficient distress and anxiety. In relation to this, it has been argued that words are less powerful in attracting attention than threatening pictures (Kindt & Brosschot, 1997). However, our primary interest in attachment-specific threat urged us to use word stimuli

because such stimuli provide precise semantic control and because it is difficult to find pictures that explicitly represent negative attachment experiences.

Another two remarks can be made on the present study. First, it is worth noting that the two attachment dimensions of anxiety and avoidance, as measured by the ECR, were significantly related, which opposes the theoretical prediction that anxiety and avoidance are orthogonal constructs (Bartholomew & Horowitz, 1991; see also Shaver & Mikulincer, 2002). A second remark concerns the fact that our sample is skewed in terms of gender, which prevented us from investigating possible gender differences in the relation between attachment and attention. However, because we did not find any differences in attachment styles and attentional biases between the men and women included in our sample, and because attachment research has revealed no or only weak gender differences in attachment styles (Hazan & Shaver, 1987; Schmitt et al, 2003), we do not regard the unequal distribution of gender as truly problematic in the present study. Nevertheless, the issue of gender differences in attentional biases should receive more careful attention in future research.

To our knowledge, the current study is among the first to examine selective attention in relation to adult attachment. Attentional bias effects have been studied extensively in the context of anxiety disorders. As such, this literature can provide a broader framework for interpreting our results. In fact, it has already been argued that attachment theory and cognitive formulations of anxiety bear many similarities (e.g. Besser & Priel, 2003; Carnelley, et al., 1994; Roberts, Gotlib & Kassel, 1996). The present study supports this theoretical link because our results show parallels with research on attention and anxiety. More specifically, the finding that the interaction between anxiety and avoidance determines attention to threat is largely compatible with Eysenck's (1997) notion that cognitive processing of threat is a function of both anxiety and defensiveness. Furthermore, it has been demonstrated that the effects of anxiety and defensiveness are most evident for socially-relevant threat words (Fox, 1993), which is in line with our finding that the attentional avoidance effect was specific to attachment-related threat words. Such words are by definition interpersonally oriented. Given these parallels between attachment theory and theories on anxiety, and given the important role of early (interpersonal) adverse experiences in the development of clinical anxiety, the study of selective attention in adult attachment could be useful to advance our knowledge on the

link between attachment and psychopathology (e.g., Carnelley, Pietromonaco, & Jaffe, 1994; Roberts, Gotlib, & Kassel, 1996). More systematic research is needed to investigate the interaction between emotional disorders and attachment representations by including clinical samples in the study of attachment phenomena. Furthermore, research on the link between attachment and attentional processing has promising implications for clinical work. By understanding these links (and the social and emotional outcomes associated with these links), clinicians could begin to develop interventions that target defensive, inflexible, and/or negative types of information-processing. This is particularly important when considering that attentional processes mediated by affect regulation have the secondary effect of biasing interpretations and memories of interpersonal experiences. Through their influence on higher-order cognitive processes, attentional biases are likely to have consequences for biases in beliefs and expectations which, in turn, influence the allocation of attention. Accordingly, attentional biases can function as positive feedback loops, becoming increasingly resistant to change and associated with increasingly dysfunctional emotional states and behaviours.

In conclusion, our study represents an important preliminary investigation of selective attention in the research field of adult attachment. Our results suggest that high levels of attachment anxiety and avoidance incline people to direct attention away from attachment-related threatening information. Drawing on the general literature on attentional biases, it can be suggested that this avoidant attentional style assists in mood regulation in insecure individuals by reducing anxious mood states in a self-regulatory way. Such cognitive processes may develop from adverse attachment experiences and contribute to interpersonal as well as intrapersonal functioning. Hence, investigating attentional processing in the context of attachment could be extremely important for clarifying potential pathways through which internal psychological models of attachment relationships are linked to emotional experiences over the life course.

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CHAPTER 2

ATTENTION TO POSITIVE AND NEGATIVE EMOTIONAL FACE EXPRESSIONS AND ADULT ATTACHMENT[1]

ABSTRACT

In the present study, we investigated the relation between adult attachment styles and attention for happy, angry, and neutral emotional face expressions. Using a modified version of the exogenous cueing paradigm, we found that the combination of high attachment anxiety and high attachment avoidance was associated with reduced attention for angry faces. We also observed that anxious individuals tended to orient attention away from happy faces, especially in combination with high scores on attachment avoidance. These findings replicate and extend the results of a previous study and provide additional information on the role of attention in adult attachment.

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[1] Dewitte, M., & De Houwer, J. (in press). Adult attachment and attention to positive and negative emotional face expressions. *Journal of Research in Personality.*

INTRODUCTION

Attachment theory provides a useful framework for understanding individual differences in emotion regulation (Bolwby, 1962, 1982). According to this theory, the attachment system is critical in the regulation of distress because it motivates people to seek or maintain proximity to the attachment figure when encountering threat. Yet, whether or not people will attain the desired state of felt security through proximity seeking is largely determined by one's appraisal of attachment figure availability and one's expectations about the likelihood of attaining proximity goals. As such, interindividual differences exist in how the attachment system is likely to function and this variability in attachment orientation is commonly described in terms of two dimensions of attachment insecurity, namely anxiety and avoidance. Recently, the role of attachment-related negative biases in several aspects of information processing has been emphasized (see Mikulincer & Shaver, 2003). In this context, it has been argued that attentional processes play a key role in the triggering and regulation of the attachment system and clear predictions can be made on the relation between attachment style and attention (Bowlby, 1969, 1982; Main & Hesse, 1990). Specifically, it can be assumed that anxious individuals adopt a hypervigilant attentional style that is oriented towards threat and signs of attachment figure unavailability, whereas attachment avoidance is characterized by dismissal of threatening information in an attempt to prevent activation of the attachment system. Although attention is widely implicated in attachment system functioning, little research has been directed at investigating whether the different attachment strategies guide attention towards or away from threat in the predicted ways.

So far, most of the research on the attachment-attention link could not confirm the predicted differences in attentional processing as a function of the specific type of attachment insecurity. Instead, it was found that both anxious and avoidant individuals orient attention away from threat and negative emotional information (Kirsh, & Cassidy, 1997; Main, Kaplan & Cassidy, 1985; Van Emmichoven, Van Ijzendoorn, De Ruiter, & Brosschot, 2003). However, these preliminary studies on attention generally adopted a categorical, rather than a dimensional, approach to measure attachment-style differences and did not use appropriate experimental tasks that allow one to draw unambiguous conclusions

about the spatial orientation of attention. Dewitte, Koster, De Houwer, and Buysse (2007) therefore conducted a new study in which they did adopt a dimensional approach towards individual differences in attachment and used a dot-probe task to examine the spatial allocation of attention. As stimulus material, they used attachment-related threat, general threat, attachment-related positive, and general positive words. This study revealed that attachment insecurity was associated with an attentional bias away from attachment threat words and this attentional avoidance effect was best predicted by the interaction between high attachment anxiety and high attachment avoidance. Note that these results contradict the theoretical prediction that attachment anxiety is associated with enhanced attention for (relational) threat.

Because the study of Dewitte et al. (2007) is thus far the only one that directly examined the relation between attachment dimensions and attention allocation to threat, we conducted a new study aimed at replicating and extending the previous results using a different type of stimuli and a different attentional task. In the present study, pictures of emotional face expressions were presented in an exogenous cueing task (Posner, 1980). We selected pictures of happy, angry, and neutral faces because pictures represent more potent and ecological valid threat cues than words (Bradley et al., 1997) and because happy and angry faces might be interpreted as signalling attachment figure availability and unavailability, which are central attachment concerns.[2] In relation to the latter, previous research has shown that memory and attention impairments are specific to attachment-related themes (e.g., Dewitte et al, 2007; Edelstein, 2006). The exogenous cueing task is, together with the dot probe task, one of the most widely used tasks in attentional bias research and provides information on the underlying mechanisms of attention allocation. In a modified cueing paradigm, a target stimulus appears at one of two spatial locations, cued by an emotional stimulus that precedes the same ('valid trial') or the opposite spatial location of the target ('invalid trial'). Faster responding on valid trials compared with

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[2] Previous research has already used emotional faces in the context of attachment (Fraley, Niedenthal, Marks, Brumbaugh, & Vicary, 2006; Maier, Bernier, Pekrun, Zimmerman, Strasser, & Grossmann, 2005; Niedenthal, Brauer, Robin, & Innes-Ker, 2002). In these studies, a morph movie paradigm has been adopted in which a happy, angry, or sad face changed gradually into a neutral one and vice versa. Yet, this morph task is more likely to measure one's interpretation of the emotional face rather than registering the direction of spatial attention to the facial cue.

invalid trials is called the 'cue validity effect', which is an index of attention allocation to the cue. Contrary to the dot-probe task, neutral and emotional stimuli are not presented simultaneously, which allows determining whether attention is drawn by emotional cues (i.e., attentional engagement) or whether people have difficulties in disengaging attention from emotional cues (Fox, Russo, Bowles, & Dutton, 2001).

Based on the results of the Dewitte et al. (2007), we predict that the interaction between attachment anxiety and avoidance will be related to reduced attention for angry faces. In the case of happy faces, however, it is difficult to make specific predictions. Because the attachment system is primarily oriented towards coping with negative information, attachment theory incorporates few assumptions about the processing of positive information as a function of attachment style. Furthermore, previous research revealed no relationship between attention for positive words and individual differences in attachment style (Dewitte et al., 2007; Van Emmichoven et al., 2003).

METHOD

Participants

Forty-two first year psychology students (28 women, 14 men) participated in the experiment as a part of their course requirements.

Materials

The stimuli for the exogenous cueing task were pictures of angry, happy, and neutral faces, taken from the Karolinska Directed Emotional Faces (KDEF) data base (Lundqvist, Flykt, & Öhman, 1998). All were adjusted to the same size (326 pixels x 326 pixels). 12 pictures (4 angry, 4 happy, 4 neutral pictures) were selected for the practice trials and 48 pictures (16 pictures of each emotion category) for the test trials. The exogenous cueing task was programmed using the INQUISIT Millisecond software Package (Inquisit 2.01, 2005) and presented on a Pentium II computer with a 17 inch colour monitor. Participants responded by pressing the Q or M key of an AZERTY keyboard.

Attachment style was measured using a Dutch translation of the Experiences in Close Relationships Scale-revised (ECR-R; Fraley, Waller, & Brennan, 2000; ECR-R-NL, Buysse & Dewitte, 2004) which has proven to be internally consistent and adequate in terms of construct validity. In the current sample, Cronbach's alphas were high for the Anxiety subscale ($\alpha = .92$) as well as for the Avoidance subscale ($\alpha = .84$). As recommended, we asked our participants to fill in the questionnaire while holding their primary attachment figure in mind.

Procedure

After signing an informed consent form, participants were seated behind the computer at a distance of approximately 60 cm from the screen. Instructions on the computer screen informed them to respond as quickly and accurately as possible to the location of a target, which could appear on the left or right side of the computer screen. Participants were also informed that, before the target appeared, a picture would be presented at the same or the opposite location of the target. The location of the picture cued the spatial position of the target on 50 % of the trials (valid trials) and the opposite position on the other 50 % of the trials (invalid trials).

The task began with 12 practice trials, followed by 192 test trials. Each trial started with the presentation of two white frames (8.5 cm high by 7 cm wide) on a black background and located on both sides of a fixation cross. The frames remained on the screen throughout the entire trial. After 500 ms, a face picture was presented for 500 ms, replacing one of the two frames. Next, the face was masked for 50 ms by a white frame in order to prevent impaired target detection by after-effects of the picture. Then, the target (a black square of 1.1 x 1.1 cm, 1° x 1°) appeared and remained on the screen until the participant responded. The order of the trials was determined randomly. Each emotional picture was presented four times and the inter-trial interval was 500 ms. The ECR-R was administered after the dot-probe task.

RESULTS

Latencies from trials with errors were removed as well as reaction times (RTs) shorter than 200 ms or longer than 750 ms (see Koster, Crombez, Van Damme, Verschuere, & De Houwer, 2004). Additionally, probe detection latencies that were three standard deviations above or below the individual mean were excluded from statistical analyses. In total, 3.3 % of the data were removed for these reasons.

A Valence (angry, happy, neutral) x Cue validity (valid, invalid) repeated measures ANOVA revealed a significant cue validity effect, $F(1, 41) = 39.10$, $p < .01$, indicating faster responding on valid trials ($M = 318$ ms) than on invalid trials ($M = 332$ ms). No other effects were significant, Fs < 1.2.

To investigate the relation between attention and individual differences in attachment style, three attentional indices were calculated: (1) cue validity effect = RTs on invalid trials - RTs on valid trials; (2) engagement effect = RTs on neutral valid trials - RTs on happy or angry valid trials; (3) disengagement effect = RTs on invalid happy or angry trials - RTs on invalid neutral trials (Fox et al., 2001). On all three indices, a positive score indicates that attention is directed more towards the cue. One-sample t-test revealed that the cue validity effects were significant for all three emotional expressions, $t(1, 41) = 6.02$, $p < .01$ for *angry* faces, $t(1, 41) = 3.57$, $p < .01$ for *happy* faces, and $t(1, 41) = 5.71$, $p < .01$ for *neutral* faces, whereas the engagement and disengagement effects did not reach significance (all p's > .10).

Next, a multivariate regression analysis was conducted, entering the cue validity effects for angry, happy, and neutral faces as dependent variables and attachment anxiety, avoidance, and their interaction term as predictors. To reduce the effects of multicollinearity, the predictor variables were centred (Aiken & West, 1991). This analysis revealed a multivariate main effect of attachment anxiety, $F(1,36) = 4.60$, $p < .01$, and a marginally significant multivariate effect of the interaction between anxiety and avoidance, $F(1,36) = 2.54$, $p = .07$. To interpret these effects, post hoc univariate analyses were conducted on each of the attentional bias indices.

The univariate analyses on the cue validity effect for *angry faces* yielded a marginally significant main effect of attachment anxiety, $\beta = -.31$, $t(3, 38) = -1.88$, $p = .07$, and a significant interaction of attachment anxiety and avoidance,

β = -.36, t(3, 38) = -2.20, p < .05. To interpret this statistically significant interaction term, we plotted regression lines for high (+1 SD above the mean) and low (-1 SD below the mean) values of both attachment dimensions (Holmbeck, 2002). When attachment avoidance was considered as the moderator variable, significance tests for both slopes indicated that only the High avoidance regression line was significant, β = -.78, t(3, 38) = -2.46, p < .05. The slope for the Low avoidance regression line did not reach significance, β = .15, p > .10. This indicates that a higher score on attachment anxiety is related to a decrease in the attentional bias for angry faces, but only when attachment avoidance is high (see Figure 1). When attachment anxiety was treated as the moderator variable, a similar pattern emerged. That is, the High anxiety regression line was marginally significant, β = -.52, t(3, 38) = -1.91, p = .06, whereas the Low anxiety slope did not reach significance, β = .41, p > .10. This suggests that higher levels of attachment avoidance were associated with reduced attention for angry faces, but only when attachment anxiety was high (see Figure 2).

Fig. 1. Attentional bias for angry faces as a function of attachment anxiety and avoidance, with attachment avoidance as moderator variable
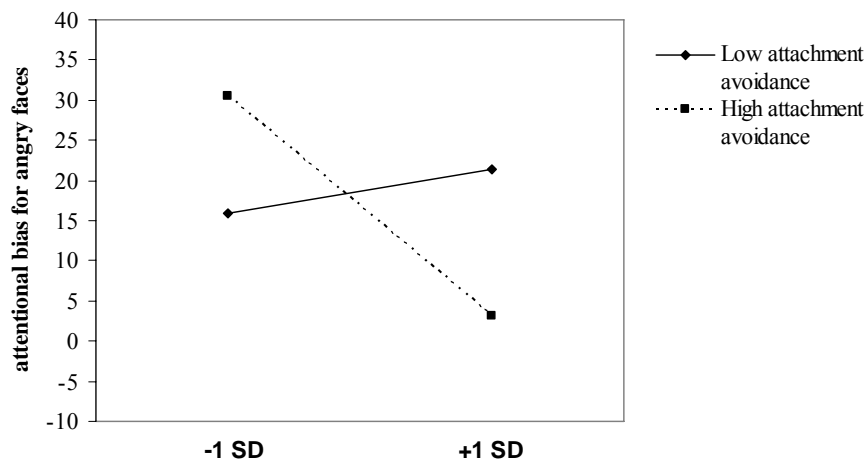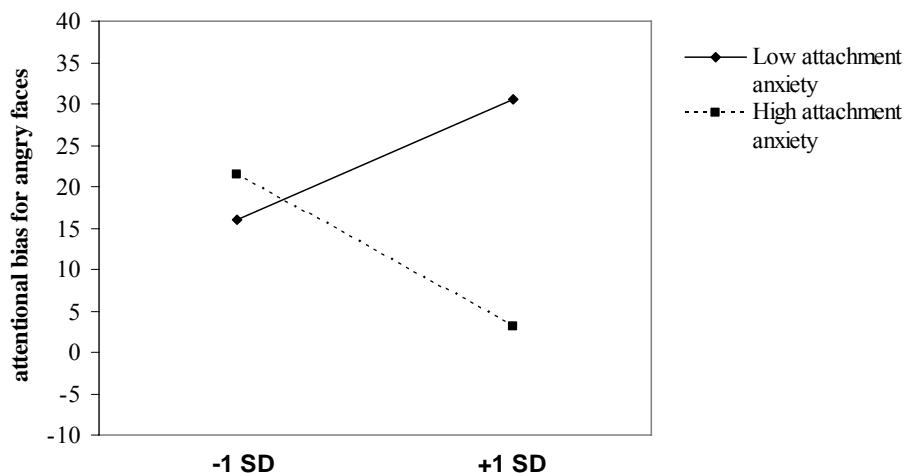
Fig. 2. Attentional bias for angry faces as a function of attachment anxiety and avoidance, with attachment anxiety as moderator variable

The analyses on the cue validity effect for *happy faces* revealed a significant main effect of attachment anxiety, β = -.46, t(3, 38) = -2.83, p < .01. This indicates that higher scores on attachment anxiety were related to reduced attention for happy faces. A marginally significant interaction effect of attachment anxiety and avoidance was found as well, β = -.29, t(3, 38) = -1.8, p = .07. By plotting the regression lines for high and low values on both attachment dimensions, it was found that only the High avoidance slope was significant, β = .-.82, t(3, 38) = -2.70, p < .01, but not the Low avoidance slope, β = -.05, p >.10. This suggests that attachment anxiety was associated with reduced attention for happy faces only in combination with high scores on attachment avoidance (see Figure 3). The analyses with anxiety as the moderator variable did not reveal significant effects, ts < 1.5.

Finally, no significant relations were found between attachment style and the cue validity for *neutral faces*. The latter indicates that the effects of attachment anxiety and the interaction between anxiety and avoidance were specific to the cue validity effects for emotional (i.e., angry and happy) faces. The multivariate analyses on the engagement and disengagement scores revealed no significant effects, Fs < 1.05.

Fig. 3. Attentional bias for happy faces as a function of attachment anxiety and avoidance, with attachment avoidance as moderator variable
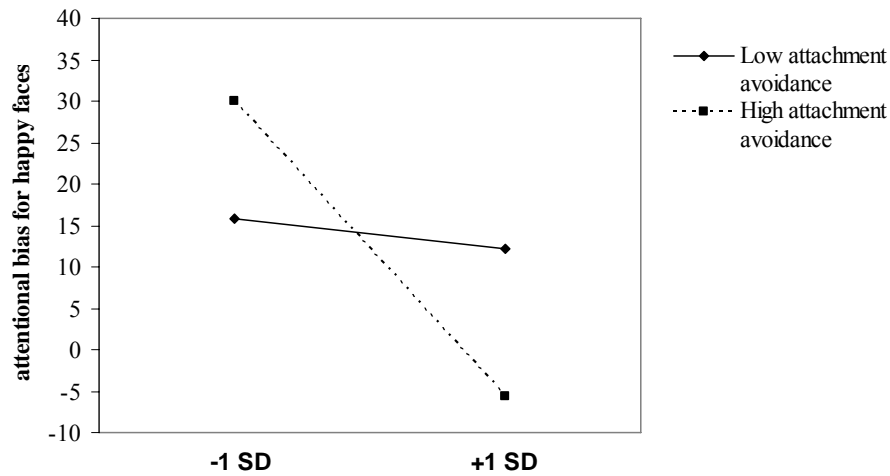
DISCUSSION

The present study aimed at further examining attachment-style differences in selective attention for emotional cues. The results on attentional processing of angry faces were in line with those of Dewitte et al. (2007). In both studies, the combination of high scores on attachment anxiety and avoidance was associated with a decrease in attention for relationally threatening stimuli. Hence, the results of the present study attest to the reliability and generality of the results of Dewitte et al. The attentional pattern observed in this and previous studies could be explained by referring to the defensive processing mechanisms that are characteristic of high anxious-high avoidant (i.e., fearfully attached) individuals. Their continuous fear of being rejected and hurt by significant others may incline the latter to use emotion-minimizing strategies that involve pre-emptively redirecting attention away from threatening information in order to prevent that negative affect will be encoded and experienced. As such, their avoidant attentional style may serve as a protective bias, that is, protecting them from being overwhelmed by negative emotions and memories (see also Main & Hesse, 1990).

No support was found for the presumed attentional styles of anxious and avoidant individuals (Mikulincer & Shaver, 2003). That is, attachment anxiety was associated with a tendency to direct attention away from negative emotional information. When considering expressions of anger as signalling both attachment figure unavailability and rejection, it does seem remarkable that anxious individuals do not show the predicted vigilance to threat. However, taking into account their hypersensitivity to rejection cues, it is reasonable to assume that limiting attention to negative information is functional in maintaining their attention on current goals (i.e., proximity maintenance). Furthermore, the observed attentional avoidance effect could also be regarded as a defensive response towards information that makes salient their underlying fear. It is also worth noting that avoidant individuals, who are thought to be defensive regarding negative emotions as a means to minimize their impact, do not avoid negative stimuli when they are not feeling relationally anxious as well. In fact, the present results revealed a main effect of attachment anxiety, where we would expect a main effect of attachment avoidance. In other words, attachment avoidance does not seem to be the critical dimension in averting attention away from threat, which would have been expected based on attachment theory. However, in interpreting these results, it is important to bear in mind that the effect of attachment anxiety on attention allocation should not be considered independent from the effect of attachment avoidance and vice versa. That is, both dimensions have a joint effect on directing attention to threat, an idea which is in line with the theory of Eysenck (1997) on anxiety and defensiveness.

The present study also revealed that attachment anxiety was related to reduced attention for happy faces. Although attachment theory does not make specific predictions regarding the processing of positive information, this result seems at first sight contra-intuitive, given that happy faces signal acceptance and willingness to provide care and support. Such signals are highly desirable for anxiously attached individuals. Again, it should be noted that the effect of attachment anxiety on attention to happy faces tended to be qualified by a marginally significant interaction effect between anxiety and avoidance, indicating that the negative relation between anxiety and attention to positive cues was conditional on high scores on attachment avoidance. This result could be explained in light of the avoidant strategies underlying fearful attachment.

High anxious-high avoidant individuals are assumed to avoid intimacy and shy away from any emotional information out of fear that positive input will not be forthcoming and that negative information will be too intense (Bartholomew & Horowitz, 1991). Hence, looking away from cues that invite interpersonal interactions (such as a happy face) could be interpreted as an attempt to avoid the pain of disappointment and rejection. Also note that attentional avoidance emerged only when attachment avoidance, rather than attachment anxiety, was considered as the moderator variable. This result is in line with the work of Edelstein (2006) who also found that positive attachment-related constructs may activate the defensive processes that are characteristic of deactivating strategies.

In conclusion, the present results provided additional support for the joint effect of attachment anxiety and avoidance on attention allocation and suggests that high anxious-high avoidant individuals tend to redirect attention form *all* emotional cues, and not only from negative cues. It is noteworthy that although happy and angry faces differ in terms of valence, they are both signalling other's dominance (e.g., Hess, Blairy, & Kleck, 2000) which may be considered as a negative incentive in terms of attachment bonding. The latter could possibly explain why a similar pattern was observed for both types of stimuli as a function of attachment style; a result that is actually in line with previous research on attention and perceptual processing in the context of attachment (Edelstein, 2006; Maier et al, 2005; Niedenthal et al, 2002).

Still, several issues need to be addressed in future research. For instance, we have to be careful in interpreting the lack of vigilance-effects in anxious individuals because we presented the faces for 500 ms. This stimulus presentation time may have been sufficient to induce a vigilant-avoidant attentional pattern (Mogg, & Bradley, 1998). Hence, it is possible that anxious individuals do selectively attend to emotional stimuli when attention is assessed after a shorter stimulus presentation. In addition, it may be useful to choose other baseline stimuli than neutral faces, because it can be argued that these reflect ambiguous social information, which could interfere with attentional responses. Note that this might have been responsible for the lack of significant engagement and disengagement effects in the present study. Furthermore, using pictures of the actual attachment figure displaying different emotions might help to boost the attentional bias effects and is, in fact, necessary to prove the ecological validity of attentional paradigms in adult attachment research.

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CHAPTER 3

SELECTIVE ATTENTION FOR THE ATTACHMENT FIGURE AND ADULT ATTACHMENT[1]

ABSTRACT

In four experiments, we tested the assumption that, under conditions of threat, people will selectively direct attention to attachment figure-related cues and that this attentional effect will be related to individual differences in attachment style. Participants completed a dot probe task in which pairs of first names were presented. The name pairs consisted of the participant's own name and a neutral name (Experiments 1-4), the name of their attachment figure and a neutral name (Experiments 1-4), or the name of an acquaintance and a neutral name (Experiments 2, 3, and 4). A significant attentional bias effect was found for the attachment name in an attachment-related context, regardless of whether the context was threatening or positive. The results of Experiment 2 provided evidence that the attentional bias effects were not driven by familiarity effects, whereas Experiment 4 excluded an interpretation in terms of salience. Attachment anxiety was associated with hypervigilance towards the attachment figure's name in both a threatening and positive attachment context. Attachment avoidance was not related to any of the attentional bias effects.

INTRODUCTION

Bowlby's attachment theory (Bowlby, 1969, 1982) has a strong influence on our present understanding of child and adult attachment. Although this theory already proposed an information-processing model of attachment, experimental research into the mechanisms by which people process attachment-related material is limited. Specifically early information-processing mechanisms such as attention, that are considered of key relevance in the regulation of the attachment system (Main, 1990), have not yet been studied systematically. Therefore, the present set of studies focuses on a neglected component of attachment system functioning by investigating the relation between attachment style and selective attention to attachment figure-related information in adults.

Cognitive View on Attachment

Central to Bowlby's attachment theory is the concept of internal working models (IWM) that evolve out of early attachment experiences with primary caregivers. These basic cognitive structures are assumed to enclose specific *beliefs*, goals, and expectations as well as *processes* that influence the encoding of interpersonal information (Pietromonaco & Barrett, 2000). Attachment working models are presumed to affect pathways from childhood to adulthood by shaping cognitive, emotional, and behavioural responses that provide guidelines for coping with distress. One particularly important mechanism that might mediate linkages between past and present attachment representations is the process of selective attention. The latter has been argued to be of key relevance in extracting motivationally relevant information from our environment and hence guides our perception of the world. Furthermore, the deployment of attention is believed to be a crucial mechanism through which people regulate thoughts, feelings, goals, and behaviour (see Lang, Bradley, & Cuthbert, 1997; Mogg & Bradley, 1998). Within the attachment domain, a few researchers have started to investigate the role of attentional biases in the processing of threatening information (Belsky, Spritz, & Crnic, 1996; Dewitte, Koster, De Houwer, & Buysse, 2007; Kirsch & Cassidy, 1997; Main, Kaplan, & Cassidy, 1985; Zeijlmans Van Emmichoven, Van Ijzendoorn, deRuiter, & Brosschot, 2003). However, attention involves more than the filtering of incoming information, which is just a first step in the activation of the

attachment system. That is, attention allocation may also serve important functions for the regulation of the attachment system once it has been activated.

The Attachment Behavioural System

A central tenet of Bowlby's attachment theory (1969, 1982) is that children and adults have an innate attachment behavioural system that is organized around seeking proximity towards significant others in times of need. When there is no signal of threat or when the attachment figure is perceived as nearby and responsive to one's needs, the attachment system remains quiescent and one feels safe and confident to engage in other behavioural activities (e.g., exploration and affiliation). Once a threat has been detected, however, the attachment system becomes automatically activated, resulting in feelings of insecurity. To deal with these distressing feelings, people seek proximity towards the attachment figure to get comfort and protection. When this attachment figure is perceived as available and thus willing to provide support, the individual regains a sense of 'felt security', ending the activation of the attachment system. Repeated interactions with an available attachment figure usually result in the development of positive expectations about the availability of others in times of need, which is characteristic of securely attached individuals. Conversely, when the attachment figure is appraised as being unavailable and unresponsive, feelings of insecurity remain active, which encourages the development of alternative strategies of affect regulation. The latter coincide with the development of negative expectations about the self and/or the other, which is characteristic of anxiously and avoidantly attached individuals (Brennan, Clark, & Shaver, 1998). Although both anxious and avoidant attachment are commonly referred to as insecure attachment, each style is associated with a distinct way for coping with distress. Anxiously attached individuals adopt hyperactivating strategies which are manifested in exaggerated threat appraisals, increased proximity-seeking behaviour, and hypervigilance towards the attachment figure. Avoidantly attached individuals, on the other hand, avoid attention and proximity to the attachment figure by deactivating the attachment system and relying on themselves to cope with distress (Fraley & Shaver, 2000; Mikulincer & Shaver, 2003).

This model clearly emphasizes that proximity seeking is a central coping mechanism for dealing with distress and that individual differences in attachment style contribute to distress-regulation by relying on, intensifying, or inhibiting proximity seeking towards the attachment figure. Given that the regulation of felt security and the maintenance of proximity are a central pursuit of IWM (Bretheron, 1985), it can be argued that IWM and their underlying processes play a key role in the regulation of the attachment system.

The appealing nature of this model resides in the fact that it integrates a normative and intra-individual perspective on attachment, while putting forward several clear and verifiable assumptions. First of all, the attachment system gets activated only in threatening conditions. That is, attachment-related as well as attachment-unrelated threat cues trigger the operation of attachment processes in order to achieve the goal of proximity towards the attachment figure. This stress-attachment link has been well-documented in the literature. Several studies among infants as well as adults have demonstrated that the encounter with stressful events such as separation (e.g. Ainsworth, 1978; Fraley & Shaver, 1998), thoughts about loss (e.g., Fraley & Shaver, 1997), interpersonal conflict (Noller, Feeney, Bonnell, & Callan, 1994; Pietromonaco & Barrett, 1997), distress (Mikulincer, 1998; Simpson, Rholes, & Nelligan, 1992), and attachment-related and -unrelated threat words (Mikulincer, Birnbaum, Woddis, & Nachmias, 2000; Mikulincer, Gillath, & Shaver, 2002) increases proximity seeking at the behavioural as well as at the cognitive level. These studies also showed that individual differences in attachment style influence the experience and expression of attachment system activation. Mikulincer and colleagues (2000) have provided interesting evidence on this behalf. In three experiments using a lexical decision task after priming of a threat or neutral word, they found that secure individuals react to threat-primes with heightened accessibility of proximity-related thoughts. Anxious individuals, in contrast, had ready access to both proximity-related thoughts and worries following either a threatening or neutral prime, which points to their chronically active attachment system. Avoidantly attached individuals reacted the same as secure ones, except they displayed defensive suppression of proximity worries. Beyond these individual differences, the three attachment groups reacted to threat with heightened accessibility of proximity themes, which supports the normative component of

the stress-attachment link. This indicates that, in a distressing context, everyone undergoes (preconscious) activation of the attachment system.

Secondly, the attachment behavioural system is specifically oriented towards the attachment figure. That is, only proximity to or thoughts about the attachment figure can stop or prevent activation of the attachment system. Three features are critical in distinguishing attachment figures from non-attachment figures (Hazan & Shaver, 1994; Hazan & Zeifman, 1994). First, this person should be a target of *proximity maintenance*, meaning that one enjoys close contact with the attachment figure and gets upset when separated from him/her. Secondly, an attachment figure is used as a *safe haven* in times of distress, illness, or danger, meaning that this person provides support, protection, and advice when feeling sad or upset. Third, an attachment figure is relied on as a *secure base* from which one can explore the world, because this person promotes feelings of confidence and security. Given that several persons can serve these attachment functions, it is generally believed that people can have more than one attachment figure (Collins & Read, 1990; Mikulincer & Arad, 1999; Ross & Spinner, 2001). In the present study, we were interested only in the primary attachment figure with whom one maintains a long-term and strong affective bond.

The third aspect of the attachment behavioural system that we want to emphasize is the most important one in terms of the present investigation. That is, adults, contrary to children, do not necessarily need the physical proximity of the attachment figure to obtain a sense of felt security. A mental representation of this person can suffice. Hence, threat automatically activates thoughts about the attachment figure, and these internal representations can become symbolic sources of protection (Mikulincer & Shaver, 2003). At the cognitive level, such mental representations might direct attentional resources towards attachment figure-related information. Accordingly, it can be argued that attentional factors contribute to proximity maintenance and as such influence the regulation of the attachment system.

In summary, the attachment system (1) gets activated only in distressing conditions, (2) is specifically oriented towards the attachment figure and, once activated, (3) elicits a mental representation of the attachment figure as a means to obtain a sense of psychological proximity (Mikulincer & Shaver, 2003). On the basis of these three assumptions of the attachment behavioural system, one

can predict that, under conditions of threat, adults will selectively direct attention to information related to the attachment figure and this mechanism will be associated with individual differences in attachment style. The present studies were set out to test these hypotheses. There is one set of data that has some bearing on this research question. In three experiments, Mikulincer, Gillath, and Shaver (2002) primed their participants subliminally with (attachment-related as well as attachment-unrelated) threat words, followed by a lexical decision task in the first two studies and an emotional Stroop task in the third study. The target stimuli in these cognitive tasks were names of the attachment figure, close persons, known persons, and unknown persons. Their results showed that threat primes led to increased accessibility of attachment figure representations, as indicated by faster reaction times on the lexical decision task and longer colour-naming latencies on the emotional Stroop task. They also found that this effect was stronger in anxious individuals, after priming a threatening *and* neutral word, whereas the effect was smaller (and even absent in an attachment-related threat context) in avoidant individuals.

Although these data clearly show that information regarding the attachment figure is more accessible in a threatening context, they do not allow for the conclusion that people direct their attention to such information. In the present paper, we were specifically interested in attentional processes because these are at the heart of attachment theory. That is, internal working models are conceived as providing rules for the direction and organisation of attention (Main, Kaplan, & Cassidy, 1985), which implies that attentional factors play a key role in the activation and functioning of the attachment system. Hence, whereas the Mikulincer study was primarily interested in demonstrating attachment-system activation in the context of distress by measuring *cognitive accessibility*, we focused on the effect of *attentional processes* on the regulation of the attachment system. Moreover, the tasks used in previous research, namely the Stroop and lexical decision task, serve as measures of cognitive activation, but have been criticised as measures of attention allocation. Researchers have indicated some interpretative difficulties with these tasks. For instance, it has been argued that the Stroop-effect does not reflect attention, but arises from other factors such as interruption effects or task-irrelevant processes (e.g., de Ruiter & Brosschot, 1994). In the case of attachment, the latter could be positive/negative thoughts about the attachment figure or other attachment-related thoughts, which compete

for attentional resources. Similar problems have been noted regarding lexical decision tasks (MacLeod, Mathews, & Tata, 1986). Even if the Stroop and lexical decision tasks would capture a certain component of attention, it is certainly not the component of selective *spatial* attention that is in all likelihood crucial in the seeking for security and proximity from the attachment figure.

The Present Study

To investigate selective attention towards the attachment figure, we used a dot probe task (MacLeod et al, 1986), in which pairs of first names were presented. In the dot probe task, two stimuli, consisting of a critical stimulus and a neutral stimulus, are presented simultaneously at two different locations on the computer screen. After these stimuli have been removed from the screen, a small dot probe appears at the position of one of the two stimuli and participants are asked to respond as quickly as possible to the location of the dot. When the dot replaces the critical stimulus, this is called a *congruent* trial; when the dot appears at the location of the neutral stimulus, this is called an *incongruent* trial. The idea behind the dot probe task is that reaction times are faster on congruent trials than on incongruent trials because attention is already allocated at the location where the probe appears. This is labelled as a *congruency effect* and indicates selective attention. Compared with other attentional bias tasks, the dot probe task is particularly suitable for measuring selective attention, because the required response follows a double-stimulus presentation and thus implies the selection of one stimulus over another.

Hypotheses

As described earlier, the search for (psychological) proximity is part of the primary attachment strategy and can thus be regarded as a normative process. This implies that everyone is assumed to display an attentional bias effect towards the attachment figure in the context of distress. However, based on attachment theory and the aforementioned research, it can also be expected that individual differences in attachment style will modulate this attentional bias effect. Given that anxiously attached individuals are characterized by a hyperactive attachment system (Mikulincer & Shaver, 2003; Mikulincer, Shaver, & Pereg, 2003), we hypothesized that the attentional bias effect for the name of

the attachment figure would become more pronounced as attachment anxiety increases. Attachment avoidance, on the other hand, should be negatively associated with selective attention for the attachment name because individuals scoring high on the avoidance dimension tend to deactivate their attachment system when confronted with threat (Mikulincer et al, 2002).

To investigate these hypotheses, we conducted four experiments. In Experiment 1, we explored whether an attentional bias effect towards the attachment figure's name can indeed be found. In the second experiment, we examined whether this bias is specific to the attachment figure or driven by familiarity effects. Through systematic variation of the prime context, distressing (Exp 1) versus positive (Exp 3), we also investigated whether this effect is unique to a stress-eliciting context, as is postulated by attachment theory. The fourth experiment was designed to exclude the interpretation that selective attention for the attachment name is caused by potentially confounding factors such as salience.

EXPERIMENT 1

The main objective of Experiment 1 was to examine selective attention for the attachment figure's name in an attachment-related stress context. Stress was induced by a procedure in which participants were asked to imagine their attachment figure going abroad for a long period of time. In relation to this, research has demonstrated that asking people to imagine their attachment figure leaving them for a while generates an amount of distressing feelings (e.g., Mikulincer, Florian, Birnbaum, & Malishkewitz, 2002). Accordingly, being physically separated from the attachment figure can be regarded as a particularly potent cue for activating the attachment system, which makes people appeal to psychological sources of proximity. Subsequently, we administered a dot-probe task presenting stimulus pairs consisting of the first name of the attachment figure (i.e., attachment name) and a neutral name, and pairs consisting of the first name of the participant (i.e., own name) and a neutral name. Faster responding on congruent trials (dot appears at the location of the attachment or own name) than on incongruent trials (dot appears at the opposite location of the attachment or own name) indicates an attentional bias effect (MacLeod et al., 1986). Based on attachment theory, we expected to find an overall attentional bias effect

towards the name of the attachment figure. In addition, we predicted that this attentional effect would be stronger in anxiously attached individuals and weaker in avoidant individuals. By including trials with the name of the participant, we could verify whether the relation between selective attention and attachment style is specific to the attachment name.

METHOD

Participants

Our sample consisted of 59 participants. Of those, 25 were visit students from high school (mean age was 17 years) who volunteered to participate. The remaining 34 were first year psychology students at Ghent University (mean age was 18 years) who participated in return for course credit.

Materials

As stimulus material we selected single names: the first name of the attachment figure, the first name of the participant, and neutral first names. We created three types of stimulus pairs: pairs in which the name of the attachment figure was combined with a neutral name, pairs in which the participant's own name was combined with a neutral name, and filler pairs that consisted of two neutral names (to avoid habituation effects). We assured that each of the critical stimuli was assigned to one of the four neutral stimuli. Each name was presented equally often during the task. The names were presented in black uppercase letters (Arial Black, font size 38), at a distance of 5 cm above and below the centre of the screen. The probe detection task was programmed and presented with the INQUISIT Milliseconds software package (INQUISIT 2.01, 2005) on a Pentium II computer with a 15-inch colour monitor.

We used a Dutch translation of the revised Experiences in Close relationships Scale (ECR-R, Fraley, Waller, & Brennan, 2000; ECR-R-NL, Buysse & Dewitte, 2004) to measure the two attachment dimensions of anxiety and avoidance. The Anxiety scale (18 items) taps fear of abandonment and strong desires for interpersonal merger, whereas the Avoidance scale (18 items) assesses discomfort with closeness, dependence, and intimate self-disclosure.

This questionnaire has proven to be internally consistent and adequate in terms of construct validity. In the current sample, Cronbach's alphas were high for the Anxiety subscale (.89) as well as for the Avoidance subscale (.92). To ensure that we measured one's relationship-specific attachment style, we asked our participants to fill in the questionnaire holding their primary attachment figure in mind. Also note that narrowing the target to one particular person is assumed to attenuate social desirability-effects (Stein et al., 2002).

Procedure

The experiment was conducted in groups of four participants. After signing an informed consent form, we identified the participants' primary attachment figure, using the WHOTO scale which consists of six questions referring to the three critical features that distinguish attachment figures from non-attachment figures (proximity seeking and separation distress, safe haven, and secure base; Hazan & Zeifman, 1994). For each question, participants had to write the name of the person that best served each of these functions. The person that was listed most frequently was labelled as the primary attachment figure. In case of an exaequo, we chose as the attachment figure the person that satisfied the larger number of attachment-related functions (see Fraley, & Davis, 1997). Next, participants were asked to imagine this person going abroad for 1 to 2 years. This separation scenario served primarily to activate the attachment system (see Fraley & Shaver, 1998). After the priming task, they were instructed to select four neutral names from a name list of 50 male and 50 female names. A neutral name was defined as a name that did not represent anyone they knew. The neutral names from the name list were relatively 'common' names, ranging from short names to longer names. To match for word length, participants were urged to choose names with approximately the same number of letters as the name of their attachment figure. Subsequently, participants performed the dot probe task, followed by the ECR-R.

Participants were seated behind the computer at a distance of approximately 60 cm from the screen to perform the dot probe task. Our version of the task consisted of an instruction screen, 12 practice trials, and 160 test trials. Participants were instructed to respond to a small dot that would appear at the upper or lower location of the screen. In addition, they were instructed to

respond as quickly and accurately as possible. All trials were presented in a random order. Each trial started with a fixation cross that was presented in the centre of the screen for 1000 ms. Then, a name pair appeared, with one name presented in the upper spatial location and the other name presented in the lower spatial location of the computer monitor. After 500 ms, these names disappeared and one of them was replaced by a small dot (5 mm diameter). When the probe was presented at the upper location, participants pressed the Q key with the left hand; when the probe was presented at the lower location, they pressed the M key with the right hand. The names and dot probes were presented equally often at the upper or lower position of the screen. The 160 test trials were divided in two blocks (without pause in between) of 80 trials, consisting of 32 own name – neutral pairs, 32 attachment name – neutral pairs and, 16 neutral – neutral pairs.

Data analysis

Reaction times were analysed using a Name (own name, attachment name) x Congruency (congruent, incongruent) analysis of variance (ANOVA) with both variables treated as within-subjects factors. In addition, attentional bias scores were calculated and then correlated with attachment anxiety and avoidance. To retain the full range of scores on the subscales of the ECR-R and in line with the dimensional view on attachment (Fraley et al., 2000), we preferred correlational analyses to inter-group analyses. The attentional bias indices were calculated by subtracting the average detection time on congruent trials from the average detection time on incongruent trials. A positive bias score indicates vigilance (shorter reaction times on congruent trials than on incongruent trials), whereas a negative bias score indicates avoidance (shorter reaction times on incongruent trials than on congruent trials) (see Mogg, Millar, & Bradley, 2000).

RESULTS

Latencies from trials with errors were removed (less than 3 % in each condition) as well as reaction times (RTs) shorter than 200 ms or longer than 2000 ms, which were treated as outliers (see Koster, Crombez, Verschuere, & De Houwer, 2004). Probe detection latencies that were three standard deviations

above or below the individual mean were considered as additional outliers and excluded from statistical analyses.

Table 1 presents the mean response latencies for each trial type. The repeated measures ANOVA revealed a significant main effect of congruency, $F(1, 58) = 13.65$, $p < .001$, indicating that subjects responded faster on congruent trials ($M = 371$ ms, $SD = 48$) than on incongruent trials ($M = 384$ ms, $SD = 54$). Neither the main effect of name, nor the interaction effect between name and congruency were significant (all Fs < 1).

Table 1

Mean reaction times (in ms) and standard deviations of target responses in the dot probe task as a function of trial type and congruency in Experiment 1

Trial type	Congruency	*M*	*SD*
Own name – neutral name	Congruent	371	50
	Incongruent	382	52
Attachment name – neutral name	Congruent	371	49
	Incongruent	387	63

Both the attentional bias indices for the attachment name, $t(58) = 2.36$, $p < .05$, as well as for the own name, $t(58) = 3.04$, $p < .01$, differed significantly from zero. In addition, we investigated the correlations between attachment anxiety and avoidance and the attentional bias scores. These correlations are presented in Table 2. A significant positive correlation emerged between attachment anxiety and the attentional bias index for the attachment name.[2] Neither the attentional bias for the own name, nor the attentional bias for the attachment name was significantly related to attachment avoidance.

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[2] Note that when conducting regression analyses on the attentional bias scores, entering attachment anxiety, attachment avoidance, and their interaction term as predictor variables, the interaction effect between anxiety and avoidance was not significant, in none of the Experiments.

Table 2

Correlations between individual differences in attachment style, as measured by the ECR, and global self-esteem, as measured by the RSES, versus the attentional bias scores for the different trial types, throughout the four experiments

Attentional Bias Index	Attachment Anxiety	Attachment Avoidance	Global Self-Esteem
Experiment 1			
Own name	.01	-.08	
Attachment name	.32**	.15	
Experiment 2			
Own name	-.03	-.01	-.11
Attachment name	.24*	-.01	-.27**
Known name	.02	.10	.14
Experiment 3			
Own name	.15	-.07	-.04
Attachment name	.28**	-.08	-.11
Known name	-.08	-.16	.21
Experiment 4			
Own name	-.16	.01	-.02
Attachment name	-.21	-.04	-.02
Known name	.20	.19	.01

* $p < .10$; ** $p \leq .05$

DISCUSSION

The most important finding of Experiment 1 was the significant attentional bias effect for the attachment name. This result is in line with the hypothesis that attachment system activation influences cognitive processing, causing selective attention for the name of the attachment figure. Note that an attentional bias effect for the own name was found as well. Although of secondary importance, this result is interesting because previous studies have suggested that selective

attention for the own name is not a robust and stable phenomenon (Bundesen et al., 1997; Gronau, Cohen, & Ben-Shakhar, 2003; Harris & Pashler, 2004; Harris, Pashler, & Coburn, 2004).

One could argue that the observed attentional bias effect for the attachment name says little about attachment processes because a similar bias was found for the name of the participant. In other words, the bias effects may have been driven by general factors such as familiarity or personal relevance. In response to this comment, we want to emphasize, however, that only the attentional bias for the attachment name was significantly related to attachment-style differences, which suggests that the effect was indeed driven by attachment-related processes. In line with theoretical predictions, we found that the attentional bias for the attachment name was stronger for individuals scoring higher on attachment anxiety. Attachment avoidance, on the other hand, did not relate to any of the attentional bias effects. We will return to this finding in the General Discussion.

EXPERIMENT 2

To test an alternative explanation of our findings in terms of familiarity, we conducted a second experiment in which trials with the name of an acquaintance were included. The absence of an attentional bias for the name of an acquaintance with whom one meets regularly, but who does not serve attachment functions, would then argue against an interpretation in terms of familiarity and would provide additional evidence for the specificity of the attentional bias effect.

METHOD

Participants

Forty-five psychology students from Ghent University participated in the study in return for course credit. Additionally, another 14 students from various faculties at Ghent University were paid five euros for their participation in this study, resulting in a total sample of 59 participants. None of them had participated in the first experiment.

Materials and Procedure

We will describe only the differences with Experiment 1. This time, participants were asked to identify not only their attachment figure but also an acquaintance, which we called 'a known person'. They were told that a known person is someone who they meet and speak to regularly, but with whom they do not have a special, close relationship. As such, the dot probe task in the second experiment consisted of three critical trial types: own name – neutral name, attachment name – neutral name, and known name – neutral name. Again, neutral – neutral trials were included as filler trials. To obtain a complete randomized combination of critical names with neutral names, we urged the participants to choose five instead of four neutral names from the name list. In this study, the 160 test trials were divided in two blocks of 80 trials consisting of 20 own name-neutral pairs, 20 attachment name-neutral pairs, 20 known name-neutral pairs, and 20 neutral-neutral pairs.

Two self-report questionnaires followed the dot probe task, the ECR-R (Fraley et al., 2000; Buysse & Dewitte, 2004) and the 10 items of the Rosenberg Self-esteem Scale (RSES; Rosenberg, 1965). The latter was added to explore the relationship between selective attention for the own name, which was found in the first study, and self-esteem. In the current sample, Cronbach's alphas were high for both questionnaires (α = .89 for the ECR-Anxiety scale, α = .85 for the ECR-Avoidance scale, and α = .87 for the RSES).

RESULTS

Table 3 presents the mean reaction times for each trial type. We conducted a 3 x 2 ANOVA with Name (own name, attachment name, known name) and Congruency (congruent, incongruent) as within-subject factors. The main effect of congruency was marginally significant, $F(1, 58) = 3.76$, $p = .06$, indicating that participants tended to react faster on congruent trials ($M = 381$ ms, $SD = 37$) than on incongruent trials ($M = 386$ ms, $SD = 39$). In addition, we found a significant interaction effect between name and congruency, $F(1, 57) = 3.39$, $p < .05$. Similar to Experiment 1, the main effect of name was not significant, $F(1, 57) = 1.35$, $p > .10$.

With a priori *t*-tests, we showed that only the attentional bias score for the attachment name differed significantly from zero, $t(58) = 3.16$, $p < .01$. The bias scores for the own name and the known name were not significant, *t*s < 1.

Table 3

Mean reaction times and standard deviations (in ms) of target responses in the dot probe task as a function of trial type and congruency in Experiment 2

Trial type	Congruency	*M*	*SD*
Own name – neutral name	Congruent	378	40
	Incongruent	384	37
Attachment name – neutral name	Congruent	379	41
	Incongruent	390	47
Known name – neutral name	Congruent	387	40
	Incongruent	383	40

Unlike to what was found in Experiment 1, the correlation between anxious attachment and the attentional bias index for the attachment name was not statistically significant; yet, it approached statistical significance, $p = .07$ (Table 2). Furthermore, a significant negative correlation was found between self-esteem, as measured by the RSES, and the attentional bias for the attachment name. Again, no significant correlations were found between the attentional bias indices and attachment avoidance.

DISCUSSION

Most importantly, participants were faster in responding to congruent trials than to incongruent trials and this selective attention effect was more pronounced in trials with the attachment name than in the other trials. Contrary to the previous study, the attentional bias effect was specific to the attachment name; neither the attentional bias for the own name, nor the attenional bias for the known name was significant. This indicates that, in a threatening context, only

the name of someone serving attachment functions grabs attention, which is in line with attachment theory. Note that these results also suggest that the findings of Experiment 1 could not be accounted for by familiarity effects.

Again, we found meaningful relations between the attentional bias index for the attachment name and individual differences. More specifically, the attentional bias index for the attachment name was marginally significantly and positively related to attachment anxiety and negatively related to self-esteem. The latter indicates that people with low self-esteem display enhanced attention for the attachment name. Given that anxiously attached individuals are characterized by negative self-esteem (e.g., Bylsma, Cozarelli, & Summer, 1997; in our study, anxious attachment was also significantly correlated with global self-esteem, $r = -.36$, $p < .01$), this result could be regarded as indirect and additional evidence for our hypothesis concerning attachment anxiety. Again, attachment avoidance was not significantly related to any of the attentional bias indices.

EXPERIMENT 3

Experiments 1 and 2 showed that a threatening situation such as separation from the attachment figure triggers the operation of the attachment system, which inclines people to direct attention towards attachment figure-related cues. In the third experiment, we added a control condition to further examine the stress-attachment hypothesis (Bowlby, 1969, 1982). Because previous research has primarily included a neutral context as a control condition, we decided to explore the effect of a positive prime context on selective attention. According to the stress-attachment hypothesis, selective attention for the name of the attachment figure should be evident only when people imagine a threatening event involving the attachment figure, but not when imagining a benign event. To test this hypothesis, we conducted a third experiment that was identical to the second one, except that we now asked our participants to imagine spending an enjoyable evening or day out with their attachment figure. Given that no stress-eliciting context is presented, the coping mechanism of seeking proximity should not be relevant. Accordingly, no attentional bias effects should be found, except perhaps for anxiously attached individuals who may experience attachment-system activation in the absence of actual signs of threat. That is, it can be

expected that anxious individuals' chronically active attachment system and their excessive preoccupation with attachment themes will facilitate selective attention for the attachment name, even in a positive context.

METHOD

Participants

Fifty-four psychology students from Ghent University participated in the study in return for course credit. None of them had participated in the previous experiments.

Materials and Procedure

The only difference between the present study and Experiment 2 concerned the nature of the priming task. Instead of imagining their attachment figure going abroad, participants were asked to think and write about spending an enjoying day out with their attachment figure. Again, both the ECR (α = .91 for the ECR-Anxiety scale and α = .90 for the ECR-Avoidance subscale) and the RSES (α = .81) were highly internally consistent.

RESULTS

Table 4 presents the mean reaction times for each trial type. A 3 x 2 ANOVA with Name (own name, attachment name, known name) and Congruency (congruent, incongruent) as within-subject factors revealed a significant main effect of congruency, $F(1, 53) = 7.74$, $p <. 01$, indicating that participants were faster in responding to congruent trials (M = 384 ms, SD = 48) than to incongruent trials (M = 392 ms, SD = 46). Both the main effect of name, $F(1, 52) = 2.64$, $p = .08$, and the interaction effect between name and congruency, $F(1, 52) = 2.66$, $p = .08$, approached significance. With a priori t-tests, we showed that the attentional bias indices for the attachment name, $t(53) = 2.49$, $p < .05$, and for the known name, $t(53) = 2.69$, $p < .01$, differed significantly from zero. The attentional bias index for the own name was not significant ($t < 1$).

Table 4

Mean reaction times and standard deviations (in ms) of target responses in the dot probe task as a function of trial type and congruency in Experiment 3

Trial type	Congruency	*M*	*SD*
Own name – neutral name	Congruent	388	52
	Incongruent	388	47
Attachment name – neutral name	Congruent	379	51
	Incongruent	389	49
Known name – neutral name	Congruent	384	50
	Incongruent	396	51

Next, we investigated the relation between anxious and avoidant attachment and the three attentional bias indices. Table 2 shows that attachment anxiety correlated positively and significantly with the attentional bias index for the attachment name. None of the other attentional bias indices were significantly associated with individual differences in attachment style. Similar to Experiments 1 and 2, no significant correlations were found between the attentional bias indices and attachment avoidance. Global self-esteem was not significantly associated with neither of the attentional bias indices.

DISCUSSION

Unexpectedly, we observed a significant attentional bias effect for the attachment name, indicating that even in a positive relational context people generally direct attention towards their attachment figure. Contrary to what was observed in the previous experiments, an attentional bias effect was found for the known name as well. At first glance, these findings oppose the stress-attachment link, according to which the attachment system would get activated only in the context of distress. Note, however, that the observed relation between the attentional bias index for the attachment name and attachment anxiety still allows for an explanation in terms of attachment processes. That is, it has been argued that anxious individuals' preoccupation with cues of attachment figure

unavailability and amplification of threat appraisals lead to a chronic activation of the attachment system (Mikulincer et al, 2003), causing vigilance to attachment figure-related cues in every environmental transaction, whether it is a negative or a positive one. Although our results are generally not in line with the normative component of the stress-attachment hypothesis, this explanation in terms of individual differences suggests that the observed attentional bias effects are indeed driven by attachment processes. Nevertheless, an alternative interpretation for the obtained findings is still plausible. It has to be considered that our results simply reflect the fact that just before completing the dot probe task, participants were asked to think about their attachment figure. This mental focus on the attachment figure may have been sufficient to temporarily increase the salience of information related to the attachment figure, and as such may have induced the attentional bias effects for the attachment name.

EXPERIMENT 4

To test this alternative explanation, we conducted a fourth experiment that was identical to Experiments 2 and 3, except that we now primed an attachment-irrelevant context by asking our participants to imagine the known person, and not the attachment figure, going abroad for a certain period of time. This allowed us to investigate whether merely thinking about the attachment figure has induced the attentional bias effects observed in the previous experiments. According to the alternative explanation in terms of salience-effects, this priming task should lead to an attentional bias effect for the known name rather than for the attachment name. Finding no attentional bias effect in this experiment would thus strengthen the idea that the attentional bias effects in the previous experiments were specifically related to attachment processes. Accordingly, we hoped to find no attentional bias effects, not even for the attachment name.

METHOD

Participants

Sixty-two first year psychology students participated in the experiment as a part of their course requirements. None of them had participated in the previous experiments.

Materials and Procedure

These were the same as in the previous two experiments, except for the nature of the priming task. This time, participants were asked to think and write about the known person going abroad for a certain period of time. Similar to the previous three experiments, both the ECR and the Rosenberg Self-esteem Scale displayed high Cronbach's alphas ($\alpha = .87$ for the ECR-Anxiety, $\alpha = .90$ for the ECR-Avoidance, and $\alpha = .91$ for the RSES).

RESULTS

Table 5

Mean reaction times (in ms) and standard deviations of target responses in the dot probe task as a function of trial type and congruency in Experiment 4

Trial type	Congruency	*M*	*SD*
Own name – neutral name	Congruent	376	57
	Incongruent	379	49
Attachment name – neutral name	Congruent	377	58
	Incongruent	380	56
Known name – neutral name	Congruent	381	52
	Incongruent	382	51

Table 5 presents the mean response latencies for each trial type. We analysed these reaction times using a 3 (own name, attachment name, known name) x 2 (congruent, incongruent) repeated measures ANOVA. As expected, neither the

main effect of congruence nor the interaction between name and congruence were significant, Fs < 1. Also the main effect of name did not reach significance, $F(1, 61) = 1.72$, $p > .10$.

None of the attentional bias indices differed significantly from zero (all ts < 1) and none of them correlated significantly either with individual differences in attachment style or with global self-esteem (Table 2).

DISCUSSION

In line with our predictions, no significant attentional bias effect was found for the known name after an imagination procedure involving the known person. This finding indicates that the attentional bias effects for the attachment name observed in the previous experiments were not simply due to the stress-induction procedure functioning as a prime and increasing attention for the attachment stimulus. Furthermore, the absence of a bias effect for the attachment name is in line with attachment theory, because separation from a known person can be regarded as a non-threatening and attachment-irrelevant situation that is not supposed to activate the attachment system (see Mikulincer & Shaver, 2003). The fact that anxiously attached individuals did not react with vigilance towards the attachment name also seems plausible, considering that the content of the priming was not relevant in terms of attachment needs. To ascertain that the absence of a bias effect was genuine, we calculated the statistical power of the crucial test. Starting from the mean effect size of the attentional bias scores for the attachment name, estimated from Experiments 1 and 2 (mean $d = .35$), this study, with 62 participants, had a power of .77 to detect an effect of that magnitude at the .05 alpha level (two-tailed). Hence, our study had enough power to detect an effect if any should appear, but we still failed to find one. This indicates that the lack of an attentional bias for the attachment name was not the result of a lack of power.

GENERAL DISCUSSION

Although Bowlby has emphasized the centrality of internal working models as an organizing force in guiding attention, to date little is known about the relationship between attentional processing and the regulation of the attachment

system. Therefore, we argued that research into the information-processing mechanisms associated with attachment system functioning is pivotal. In attachment theory, it has been postulated that the confrontation with or the imagination of a distressing situation activates the attachment system and the primary goal of proximity maintenance towards the attachment figure (Mikulincer & Shaver, 2003). The studies reported in this paper linked this key assumption to the process of selective attention, considering it as a necessary regulatory process underlying attachment system activation. The most important finding throughout the four experiments was that we consistently found an attentional bias effect for the attachment name in an attachment-related context, regardless of whether the context was positive or negative. We also demonstrated that attention allocation was modulated by individual differences in attachment style. More specifically, we found that attachment anxiety was related to enhanced attention for the attachment figure's name in both a threatening and a positive attachment context. We will briefly summarize the experimental findings that led to these conclusions and relate these main findings to a cognitive-motivational view on adult attachment.

The first two experiments supported the central claim that, after exposure to an attachment-related *threat* prime, attention was selectively directed towards attachment figure-related information. Several sources of evidence point to the reliability and strength of these findings: First, selective attention for the name of the attachment figure was found in Experiment 1 and replicated in Experiment 2. Second, the attachment name was the only stimulus name that yielded a robust attentional bias effect. In Experiments 1 and 3, attentional bias effects for the own name and known name were found as well, but these effects could not be replicated in the following experiments, which is consistent with other studies investigating attention towards personally relevant stimuli (Bundesen et al., 1997; Gronau, Cohen, & Ben-Shakhar, 2003; Harris & Pashler, 2004; Harris, Pashler, & Coburn, 2004). Most of this research has shown that selective attention towards emotional words and names is actually not a robust and stable phenomenon. Therefore, we want to emphasize the importance of the fact that we did find a consistent attentional bias effect towards the *name* of a significant other. Third, this effect was found in a sample of non-selected individuals, even though it has been argued that attentional bias effects in a non-selected, non-

clinical sample are usually not very robust and actually not easily found at all (Mogg & Bradley, 2005).

The present findings also revealed that attention was selectively and specifically directed towards the name of the *attachment figure*. Throughout the experiments, some direct and indirect evidence was obtained in support of this idea: First, as described earlier, selective attention effects were most consistently found for the attachment name, which is fully in line with attachment theory. Second, in Experiments 2 and 4, alternative explanations (familiarity, salience) for the attentional bias effects could be excluded. Third, in Experiments 1, 2, and 3, only selective attention for the attachment name was meaningfully related to individual differences that have been proposed to modulate the effect of threat on attachment processes.

One particular finding, however, was not consistent with theoretical predictions. According to the stress-attachment link, only events that are perceived as threatening should activate the attachment system (Mikulincer & Shaver, 2003). Yet, in Experiment 3, we found that thoughts about spending an enjoying day out with the attachment figure also led to selective attention for the attachment name. This suggests that the process of selective attention was not uniquely activated by stress-eliciting stimuli. Although this finding seems at odds with the normative component of attachment system activation, an explanation in terms of attachment-style differences is still plausible. That is, selective attention towards the attachment name was specifically and exclusively related to attachment anxiety, indicating that the more anxious a person is, the more he or she will attend to attachment figure-related cues, even in a positive prime context. This fits with anxious individuals' chronic hyperactivation of the attachment system, an assumption already demonstrated in previous research. For instance, Mikulincer and colleagues (2000, 2002) found that anxious individuals show heightened accessibility to attachment themes in both a stress and non-stress context, suggesting that their attachment system is chronically activated even when there is no signal of threat and no demand for coping actions. This conclusion has been substantiated using a neutral priming context as a control condition, leaving unexplored how the attachment system cognitively reacts to an attachment-related positive context. In this respect, the present data suggest that, even in an attachment-related positive context, anxiously attached individuals rely on their hyperactivating strategies. We will

return to this finding in the following paragraph, in which we elaborate on the relation between individual differences in attachment style and attentional processing.

Our results showed that anxious individuals react with enhanced attention for the attachment figure's name in either a threatening or a positive attachment context, providing additional evidence for their hyperactive attachment system. Experiments 1 and 2 demonstrated the expected hypervigilance in a stress context, whereas Experiment 3 revealed the same attentional pattern in a positive attachment context. With regard to the first two experiments, only the first one revealed a clearly significant correlation between attachment anxiety and selective attention for the attachment name. In Experiment 2, this correlation was marginally significant, but we did find additional evidence for our hypothesis on individual differences by means of the negative correlation between self-esteem and selective attention for the attachment name. The latter could, however, not be replicated in the other experiments. One possible explanation for the fact that the pattern of findings on individual differences was somewhat dissimilar in Experiments 1 and 2 may be variation in the mean and range of attachment anxiety, avoidance, and self-esteem scores across experiments. However, post-hoc analyses revealed no indication of such differences. Another possibility is that the observed correlations with attachment anxiety are weakened by the limited range of attachment anxiety scores in our samples, which may result from the fact that our participants were not pre-selected based on their attachment style. Given that anxious attachment styles represent rather small portions of the population (Hazan & Shaver, 1987), our sample did probably not enclose extremely high anxious individuals. In fact, securely attached individuals (i.e., low anxiety and avoidance scores) formed the vast majority of our participants. Another plausible reason for the inconsistencies in the correlational results may be the low reliability of interindividual differences in dot-probe effects (see Schmukle, 2005). In the present set of data, the mean split-half reliabilities of the attentional bias effects for the attachment name were .41 in the first experiment, .23 in the second experiment, .26 in the third experiment, and .38 in the fourth experiment. Considering that sufficient reliability of measures is a prerequisite for research on interindividual differences, the low reliabilities of these dot probe tasks seriously limit the strength of the correlations one can

expect to observe. In fact, given these low reliabilities, it is striking that we did find meaningful correlations in three consecutive experiments.

Regarding the results of the third experiment, demonstrating anxious individuals' hypervigilance in a positive attachment context, it is important to note that an interpretation in terms of distress arousal is still plausible. We refer to a study by Mikulincer and Sheffi (2000) showing that anxious individuals reacted with impaired cognitive processing after a positive affect induction. According to them, anxious individuals endorse a negative interpretation of positive affect in an attempt to deny the cognitive relaxation that follows from the recognition of a safe environment, because this cognitive loosening may be perceived as a danger cue. Moreover, it is likely that, through semantic priming mechanisms, positive thoughts about the attachment figure will automatically spread into memories of negative attachment experiences that are overrepresented in the associative network of the anxious individual's mind (Mikulincer & Shaver, 2003).

In general, the results with regard to attachment anxiety are in line with attachment theory. However, in the case of attachment avoidance, results did not conform to theoretical expectations. Given that avoidantly attached individuals tend to deactivate their attachment system and inhibit proximity seeking as a means to cope with insecurity (Mikulincer & Shaver, 2003), we expected that, in a distressing context (and even in a positive attachment context), attachment avoidance would be negatively related to the attentional bias index for the attachment name. None of our experiments confirmed this finding. A possible explanation for the absence of results regarding attachment avoidance could be the nature of the threat prime. That is, separation from the attachment figure may be a particularly salient threat cue for anxious individuals, but not for avoidant individuals who are found to suppress separation-related thoughts (Fraley & Shaver, 1997; Fraley, Garner, & Shaver, 2000; Mikulincer & Shaver, 2003). Hence, it could be that our separation threat prime did not evoke sufficient distress in avoidant individuals, which would imply that no coping actions are required and thus no distance goals are being activated. In that case, the attentional bias mechanism would not be relevant. Unfortunately, no manipulation check was performed to examine the effectiveness of our threat induction in avoidant individuals. Future research should incorporate manipulation checks of threat induction or could rely on subliminal priming

procedures (see Mikulincer et al., 2002) that may reduce strategic avoidance strategies. In addition, future work is needed to investigate whether selective attention for the attachment name depends on specific threat contexts. Considering previous research showing that avoidant individuals react differently to attachment-related versus attachment-unrelated threatening contexts (Mikulincer et al., 2002), it may be interesting to precede our dot-probe task with attachment-irrelevant stress stimuli, such as failure, so that we can further explore the effect of threat on the process of selective attention.

Throughout the general discussion, we have already mentioned several limitations of the present studies and made suggestions for future research. There is, however, still an issue that needs to be discussed. That is, the dot-probe tasks in the present studies yielded relatively small differences in reaction times, which could possibly indicate that the attentional bias effects varied over the course of the experiment. Therefore, we calculated attentional bias scores on the first and second halves of the dot-probe tasks, in order to determine whether the obtained attentional biases reflect a stable effect or a momentary response that habituates quickly (see Harris & Pashler, 2004). Throughout the four experiments, these analyses revealed no significant differences between the attentional bias effects calculated on the first and second halves of the task, which suggests that selective attention towards the attachment name is a real and consistent phenomenon that is not just an artefact of averaging reaction times over numerous trials.

In closing, the present studies were among the first to assess the attentional correlates of the attachment system. Our results were generally in line with the theoretical prediction that activation of the attachment system causes selective attention towards the attachment figure and that this attentional effect is modulated by individual differences in attachment style. We are convinced that this series of studies opens a wide range of possibilities with regard to the study of attentional processes in the adult attachment domain. Our studies also have broader theoretical implications. We think that they point to the importance of incorporating information-processing mechanisms, and attention in particular, into the conceptualization of the attachment system. That is, selective attention has been related to perceptual, appraisal, and memory processes (see Mogg & Bradley, 1998), which are all relevant in the regulation of the attachment system. Furthermore, it is known that attentive processing of motivationally relevant

information is modulated by personality factors (e.g., Eysenck, 1992) and learning experiences (e.g., Koster, Crombez, Van Damme, Verschuere, & De Houwer, 2004). Accordingly, it seems reasonable to assume that, once attention is guided by established working models, this may influence and magnify the effects of previous experiences on ongoing attachment-related cognition, affect, and behaviour and could therefore play an important role in transferring early attachment experiences into working models (Bowlby, 1969, 1982). Exploring the proposed dynamic relationships between early experiences, the attachment system, information processing, and attachment behaviour is pivotal in deepening our understanding on adult attachment and social behaviour.

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CHAPTER 4

PROXIMITY SEEKING IN ADULT ATTACHMENT: EXAMINING THE ROLE OF AUTOMATIC APPROACH-AVOIDANCE TENDENCIES[1]

ABSTRACT

In two experiments, participants made symbolic approach and avoidance movements towards or away from attachment figure- and acquaintance-related cues after being primed with a distressing or a non-distressing context. Results showed that automatic approach responses towards the attachment figure were stronger in a distressing than in a non-distressing context, regardless of whether the source of distress was attachment-relevant or -irrelevant and regardless of one's attachment style. Individual differences in attachment anxiety and avoidance were associated with the predicted patterns of approach-avoidance tendencies: Attachment anxiety heightened the tendency to approach the attachment figure (Experiments 1 and 2), whereas attachment avoidance reduced this tendency (Experiment 2). The findings are discussed as providing first evidence on the role of automatic action tendencies in adult attachment.

INTRODUCTION

Over the past decades, Bowlby's attachment theory (1969, 1982) has been highly influential for understanding the regulation of closeness in attachment relationships. Central to attachment theory is the idea that individuals differ in their motivation to seek or avoid proximity towards the attachment figure in times of need. Given that motivational elements and behavioural strategies are clearly represented in attachment theory (see Collins, Guichard, Ford, & Feeney, 2004), we believe it is useful to study attachment in relation to broader motivational systems such as approach-avoidance. Consistent with this idea, it has indeed been argued that attachment behaviour is driven by an attachment motivational system that is automatically activated by threatening stimuli, evoking a set of approach or avoidance behavioural tendencies towards or away from the attachment figure. Furthermore, conceptualising proximity seeking in terms of *automatic* approach-avoidance tendencies allows for a more valid test of this mechanism as a central regulatory process in attachment system functioning and provides a broader framework for understanding individual differences in attachment behaviour.

Proximity Seeking and Adult Attachment: Theory and Past Evidence

The idea that emotions have the ability to motivate, that is, to direct behaviour towards certain (emotion-related) goals (e.g., Carver, Sutton, & Scheier, 2000; Frijda, 1986), is inherently present in attachment theory. The attachment behavioural system is commonly described as a goal-directed system that is oriented towards distress alleviation when confronted with threat by seeking proximity towards someone who can provide comfort and protection (i.e., the attachment figure) (Bowlby, 1969, 1982; Mikulincer & Shaver, 2003). It is also a goal-correcting system, meaning that the utility of one's behaviour will be appraised in light of its progress towards security attainment so that, in the case of a goal-discrepancy, the individual can adjust his/her behaviour and/or goals. When the attachment figure is believed to answer one's bids for proximity, a sense of protection and security is attained, ending the activation of the attachment system. Repeated episodes of attachment figure availability lead to the development of positive beliefs (i.e., working models) about the self and others, which in turn reinforce active approach behaviour. However, when the

attachment figure is perceived as being inattentive and unresponsive to one's needs, the primary attachment strategy of proximity seeking fails to achieve the main goal of 'felt security' and is therefore likely to be replaced by alternative strategies of distress regulation, which are driven by specific sub-goals organised around seeking (extreme) closeness or keeping independence. Hyperactivating strategies are characterized by an intense desire for closeness, which is manifested in worries about separation and abandonment, strong efforts to maintain proximity, and persistent attempts to minimize emotional, cognitive, and physical distance from the attachment figure. The main goal of this strategy is to get the unavailable attachment figure as yet to be responsive, attentive, and supporting by intensifying proximity seeking behaviour. Deactivating strategies, on the other hand, aim at inhibiting the activation of the attachment system by attenuating proximity seeking behaviour through emotional and physical distancing and self-reliance. Thoughts about closeness, separation, or abandonment are being suppressed in an attempt to avoid intimacy and interdependence while defensively convincing others of one's own efficacy and autonomy. Hyperactivating and deactivating strategies can operate independently or in parallel and are closely tied to the dimensions of, respectively, attachment anxiety and avoidance, which are assumed to underlie individual differences in attachment style (Brennan, Clark, & Shaver, 1998).

Empirical support for the normative and individual differences component of proximity seeking stems primarily from behavioural observation and self-report studies. In relation to the theory, it has been shown that couples who were separating at the airport sought and maintained more proximity than couples who were not separating (Fraley & Shaver, 1998). In addition, the results of a diary study revealed that couples reported seeking more support from their partner on days when they experienced distress (Collins & Feeney, 2005). With regard to individual differences, several studies have demonstrated that secure individuals exhibit more proximity seeking behaviour (Fraley & Shaver, 1998) and seek or provide more support than insecure individuals, especially in a distressing situation (e.g., Collins & Feeney, 2000; Simpson, Rholes, Orña, & Grich, 2002, Simpson, Rholes, & Nelligan, 1992). Furthermore, they were found to be more comfortable with interpersonal closeness when discussing personal issues (Kaitz, Bar-Haim, Lehrer, & Grossman, 2004) and display a more open expression of thoughts and emotions in social settings (e.g., Mikulincer & Nachshon, 1991).

The opposite is shown for avoidant individuals, namely seeking and providing less support when feeling distressed, and pulling away from the attachment figure when separation is imminent. Note, however, that avoidant individuals do seek contact with their attachment figure when experiencing lower levels of distress and anxiety (see Fraley & Shaver, 1998; Simpson et al, 1992). In addition, they were found to report being less supportive (e.g., Carnelley, Pietromonaco, & Jaffe, 1996), to prefer more interpersonal distance, and to display less open communication in a relationship-relevant or social situation (Gillath, Mikulincer, Fitzsimons, Shaver, Schachner, & Barg, 2006; Kaitz et al., 2004). For anxious individuals, no clear relations were found with observable attachment-related behaviour; yet, they clearly reported more intense distress reactions in response to separation threat (e.g., Fraley & Shaver, 1998). They were also found to report higher needs for closeness and interdependence (e.g., Collins & Allard, 2001; Griffin, & Bartholomew, 1994; Mikulincer & Nachson, 1991).

Also within the social-cognitive domain, studies relying on reaction time measures have provided interesting information on the relation between attachment style, stress, and proximity seeking. For instance, Mikulincer, Birnbaum, Woddis, and Nachmias (2000) examined the accessibility of proximity themes and worries after priming a threatening and neutral word. Using a lexical decision task with proximity, distance, neutral, positive, and negative words, they found that, regardless of attachment style, the induction of threat led to faster reaction times on proximity words. In addition, individual differences in attachment style were found to modulate cognitive reactions to threat. That is, anxious individuals showed faster reaction times to distance words - compared to secure and avoidant individuals - following either a threatening or neutral prime, but reacted faster to proximity words only when a neutral word was primed. Avoidant individuals, on the other hand, generally displayed fast reaction times to proximity words, but reacted faster to proximity worries only when a cognitive load was added, which may suggest that they defensively suppress proximity worries. Note that their pattern of reaction times on proximity words contradicts their consciously reported need for cognitive and emotional distance. In a follow-up study, Mikulincer, Gillath, and Shaver (2002) elaborated on the stress-proximity link by focusing on the accessibility of attachment figure representations in situations of distress. Using a lexical

decision and an emotional Stroop task, participants were exposed to the names of their attachment figure, a close person, a known person, and an unknown person after the induction of a threat (failure or separation) and a neutral word. They found that threat primes led to higher accessibility of mental representations of the attachment figure, as was indicated by faster reaction times on trials with the attachment name. Attachment anxiety increased this effect in both neutral and threat contexts, whereas attachment avoidance was related to slower reaction times to the attachment name following a separation (but not a failure) word prime.

Proximity Seeking as an Automatic Action Tendency

An important merit of the two studies described above is their reliance on unobtrusive reaction time measures that are less susceptible to conscious deliberation and self-presentation issues than self-report and observation methods. This characteristic is especially relevant for investigating the cognitive structures and processes underlying attachment avoidance because their deactivating strategies sometimes fail in dismissing distress arousal (e.g., Dozier & Kobak, 1992) and in suppressing the need for closeness (Mikulincer et al, 2000) when measured at the automatic level. Focussing on automatic processes is thus essential for gaining deeper insight into the working mechanisms of attachment strategies of which many components are assumed to operate automatically and without conscious awareness (Mikulincer & Shaver, 2003). This certainly applies to the study of proximity seeking because the latter may be considered as an automatic action tendency associated with achieving attachment-related goals that people pursue without conscious awareness, intention, effort, and control (see Collins et al., 2004). In this respect, the Mikulincer studies can provide only partial support on the theoretical assumptions regarding proximity seeking. The tasks and stimulus material that they used can serve only as a measure of cognitive activation of *semantic knowledge* regarding proximity seeking, and do not allow for drawing conclusions on the effects of stress on *behavioural* tendencies. Moreover, Mikulincer and colleagues were primarily interested in demonstrating preconscious activation of the attachment system upon distress arousal, whereas

we wanted to focus on the effects of stress on the proximity seeking mechanism itself.

As reported in the beginning of the introduction, a key difference between individuals with different attachment styles is their level of motivation to seek closeness towards their attachment figure versus keeping independence and self-control. These behavioural differences stem from different goal-structures that can be roughly divided into approach (i.e., proximity maintenance) and avoidance (i.e., avoiding rejection) goals that are associated with approach and avoidance action tendencies (see Mikulincer & Shaver, 2007). Accordingly, it may be theoretically relevant to conceptualize proximity seeking as a motivational action tendency aimed at reducing the discrepancy between one's actual (i.e., distress) and desired goal-state (i.e., security) and to organise individual differences in proximity seeking along an approach-avoidance continuum. Note that such approach-avoidance action tendencies are likely to operate automatically and may or may not be translated into overt behavioural responses (see Carver & Scheier, 1998; Custers & Aerts, 2007).

The conceptualisation of proximity seeking in terms of approach-avoidance tendencies fits more closely with the theoretical definition of proximity seeking as a goal-directed response. Furthermore, this conceptualisation allows for empirical testing of several core assumptions of attachment theory. First, we tested the idea that, in the general population, a distressing context will automatically evoke a stronger proximity-seeking tendency towards the attachment figure relative to a non-distressing context. Second, we examined whether individual differences in attachment anxiety and avoidance modulate this general tendency and are associated with the predicted patterns of approach and avoidance, namely an increase in approach responses in the case of attachment anxiety and a decrease in the case of attachment avoidance. So far, there has been little empirical work that directly addresses these hypotheses by focusing on both the *automatic* and *behavioural* component of proximity seeking.

The Present Study

To investigate approach-avoidance tendencies that are automatically evoked by attachment figure-related stimuli, we used a stimulus response compatibility

(SRC) task that was first used by Mogg, Bradley, Field, and De Houwer (2003). In this task, participants are instructed to make a symbolic approach or avoidance response depending on a certain feature of the presented stimuli. In our version of the SRC task, on each trial a word was presented on a computer screen together with the drawing of a manikin above and below the word. The presented word could refer either to the attachment figure of the participant or to an acquaintance. Participants were instructed to make the manikin move towards (approach) or away (avoid) from the word based on the identity of the person to which the word referred (attachment figure or acquaintance). In the compatible block, an approach movement had to be made towards attachment-related words and an avoidance movement away from acquaintance-related words, whereas in the incompatible block the instructions were reversed. Subtracting the reaction times in the compatible block from the reaction times in the incompatible block gives us information on the strength of automatic approach versus avoidance tendencies towards the attachment figure. In this context, it should be noted that the SRC task is a relative measure. It allows one to draw conclusions on the extent to which one category of stimuli evokes an approach or avoidance tendency, but only relative to the extent to which another category of stimuli evokes this tendency. This is suggested by the fact that in similar tasks with two relevant categories, reactions to one category can depend on the nature of the other category (Brendl, Markmann, & Messner, 2001). Because we were interested in the impact of attachment on approach-avoidance responses, we selected as a secondary category acquaintance-related stimuli that are also familiar to the participant, but differ from attachment-related stimuli in terms of their relevance for serving attachment goals (i.e., providing comfort and security in times of need).

Hypotheses

Considering proximity seeking as the central regulatory force of the attachment system, we expect that secure as well as insecure individuals will show stronger approach tendencies towards the attachment figure in a distressing context compared to a non-distressing context. We also predict that this normative process will be modulated by individual differences in attachment anxiety and avoidance: The tendency to approach the attachment figure is

expected to increase with higher scores on attachment anxiety and decrease with higher scores on attachment avoidance. Attachment theory also postulates that attachment strategies are mainly activated upon distress arousal, because only then coping actions are required. Accordingly, it can be predicted that individuals scoring higher on attachment avoidance will display a decreased tendency to approach the attachment figure only when feeling distressed. Drawing on both attachment theory and previous research (Mikulincer et al., 2002; Rholes, Simpson, Tran, Martin, & Friedman, 2007), we did not anticipate an interaction effect between prime condition and attachment anxiety. That is, anxious individuals' chronically active attachment system is assumed to strengthen approach responses towards the attachment figure in both distressing and non-distressing contexts.

EXPERIMENT 1

METHOD

Participants

Sixty first year psychology students (48 females, 12 males) from Ghent University participated in return for extra course credit. The average age of participants was 19.80 years, ranging from 18 to 27. They were randomly divided into two priming conditions, each consisting of 30 participants.

Materials

The stimulus material for the approach-avoidance task consisted of two categories of words. Four word stimuli referred to the attachment figure, that is, first name, surname, hometown and the word "partner", "friend", "mother", or "father" (according to the nature of the relationship). Another four words referred to an acquaintance, that is, first name, surname, hometown, and the word "acquaintance". All words were presented at the centre of the screen in white uppercase letters (Arial Black, font size 42) on a black background. The manikin consisted of a white circle for the head, an ellipse for the body and lines that represented arms and legs. It was about 2.8 cm high and 1.5 cm wide (arms

inclusive). Participants could make the manikin move upwards by pressing the "8" key of the numeric part of the keyboard and could make it move downwards by pressing the "2" key. When one of these keys was pressed, the manikin "walked" towards the word presented at the centre of the screen or away from the word (towards the upper or lower edge of the screen). The approach-avoidance task was programmed and presented using the INQUISIT Milliseconds software package (INQUISIT 2.01, 2005) on a Pentium II computer with a 15-inch colour monitor.

As a measure of individual differences in attachment style, we used a Dutch translation of the Experiences in Close Relationships scale-revised (ECR-R; Fraley, Waller, & Brennan, 2000; ECR-R-NL, Buysse & Dewitte, 2004). Eighteen items tap attachment anxiety (i.e., fear of abandonment and strong desires of interpersonal merger) and 18 items tap attachment avoidance (i.e., discomfort with closeness, dependence, and intimate self-disclosure). The reliability and validity of these scales are well documented (e.g., Fraley et al., 2000; Sibley, & Liu, 2004). Also in the current sample, Cronbach's alphas were high for the Anxiety subscale ($\alpha = .90$) as well as for the Avoidance subscale ($\alpha = .95$).

Procedure

First, our participant's primary attachment figure was identified using the WHOTO scale which consists of six questions referring to the three critical features that distinguish attachment figures from non-attachment figures (proximity seeking and separation distress, safe haven, and secure base; Hazan & Zeifman, 1994). For each question, participants had to write the name of the person that best served each of these functions. The person that was listed most frequently was labelled as the primary attachment figure. In case of an exaequo, we chose as the attachment figure the person that satisfied the larger number of attachment-related functions (see Fraley, & Davis, 1997). Next, participants were asked to write down the first name, surname, and hometown of their attachment figure and to label that person's relational role (partner, friend, mother, father …). Similarly, they were asked to give the first name, surname, and hometown of someone they know and meet frequently, but with whom they do not have a special, close relationship. To ensure that the stimuli listed for the

attachment figure did not overlap with those of the acquaintance, participants were urged to choose an acquaintance that had different names and a different hometown than their attachment figure. While the experiment leader set up the computer task, participants received priming instructions. Half of the participants were asked to imagine that their attachment figure would go abroad for 1 or 2 years and to write about thoughts and feelings related to such an event (separation threat condition), whereas the other half of the participants were asked to describe a typical Tuesday (control condition). Research has shown that disruptions of proximity maintenance to the attachment figure (e.g., separation), whether these are real or imagined, generate intense distress reactions (Feeney & Kirkpatrick, 1996; Fraley & Shaver, 1997, 1998). Participants were randomly assigned to the separation threat and control condition in order to avoid systematic differences between conditions.

After the priming task, participants completed the approach-avoidance task. For this task, participants were seated behind the computer at a distance of approximately 60 cm from the screen. The task consisted of 8 practice and 64 test trials of a first response assignment, and 8 practice and 64 test trials of a second response assignment. Instructions informed the participants that on each trial they would see a word that either referred to their attachment figure or to an acquaintance. A manikin would also appear either below or above the word. Their task was to move the manikin towards or away from the word depending on the identity of the person to which the word referred. In the *compatible* block, participants were instructed to make the manikin run towards attachment-related stimuli and away from stimuli related to the acquaintance. In the *incompatible* block, instructions were reversed, that is, they had to move the manikin away from attachment stimuli and towards acquaintance-related stimuli. The order of the blocks was counterbalanced across participants.

Each trial started with the presentation of the manikin that appeared in the centre of the upper or lower half of the screen. The starting position of the manikin (above or below) was determined randomly and throughout the task the manikin appeared equally often above and below the words. After 750 ms, a word stimulus was presented at the centre of the screen. All words disappeared as soon as the manikin reached the centre of the screen (the location of the word) or the edge of the screen. The inter-trial interval was 1000 ms. The latency

between the onset of the word and the first key press was registered as the reaction time.

RESULTS

Latencies from trials with errors were removed (4.2 % of all trials). Reaction times that were shorter than 200 ms or more than 3 SD above the individual mean were treated as outliers and excluded from analyses (see Mogg et al., 2003).

Table 1

Mean reaction times (in ms) and standard deviations of the responses on the SCR approach-avoidance task as a function of congruency and prime condition in Experiments 1 and 2

Prime condition	Congruency	*M*	*SD*
Experiment 1			
Non-threat prime	Congruent	867	225
	Incongruent	889	189
Threat prime	Congruent	902	208
	Incongruent	1094	318
Experiment 2			
Non-threat prime	Congruent	802	191
	Incongruent	927	166
Threat prime	Congruent	853	163
	incongruent	1084	209

To examine our hypothesis on the normative component of the proximity seeking mechanism, we conducted a repeated measures ANOVA with compatibility as a within-subjects variable and prime condition as a between-subjects variable. The relevant mean reaction times are presented in Table 1. This analysis yielded a significant main effect of compatibility, $F(1, 58) = 11.76$,

$p < .01$, and of prime condition, $F(1, 58) = 5.00$, $p < .05$, as well as a significant interaction effect of compatibility and prime condition, $F(1, 58) = 7.47$, $p < .01$. Overall, participants reacted faster in the compatible task ($M = 885$ ms, $SD = 215$) than in the incompatible task ($M = 991$ ms, $SD = 279$), and reaction times were significantly faster in the non-threat condition ($M = 878$ ms, $SD = 224$) compared to the separation threat condition ($M = 998$ ms, $SD = 262$). The significant interaction effect indicated that participants displayed stronger approach tendencies after priming a separation threat context ($M = 191$ ms, $SD = 258$) compared to a non-threat context ($M = 22$ ms, $SD = 221$).

To investigate the relation between attachment style, as measured by the ECR, and the approach-avoidance index, we conducted hierarchical regression analyses with the approach-avoidance index as a dependent variable and prime condition, attachment anxiety, and attachment avoidance as predictors. In a first step, prime condition, attachment anxiety, attachment avoidance, and the two-way interaction of anxiety and avoidance were entered as predictors. To reduce possible problems of multicollinearity when analysing the interaction term, the anxiety and avoidance scores were centred (Aiken & West, 1991). In a second step, the two-way interactions between prime condition and attachment anxiety, and prime condition and attachment avoidance were added. The first model explained a significant part of the variance in approach-avoidance responses, $R^2 = .42$, $p < .05$. More specifically, the regression analysis revealed a significant main effect of prime condition, $\beta = .31$, $p < .05$, $d = .66$, and a marginally significant main effect of attachment anxiety, $\beta = .27$, $p = .06$, $d = .52$. The main effect of attachment avoidance was not significant, $t < 1$, $d = .15$, neither was the interaction effect between attachment anxiety and avoidance, $t < 1$, $d = .15$. In the second step, the interactions between prime condition and attachment anxiety, and prime condition and attachment avoidance did not add significantly to the prediction of approach-avoidance responses, $\Delta R^2 = .01$, $p > .10$, ts < 1, ds $< .10$. Note, however, that this test had a power of only .12 to detect a small effect ($d = .20$) and a power of .61 to detect a medium effect ($d = .50$).

We also explored whether task order would moderate the relationship between the predictors and the approach-avoidance index by entering task order and the interaction terms (i.e., task order x predictors) into the regression analyses. Neither the main term of order nor the interaction terms were

significant, ts < 1, indicating that the pattern of results was not affected by task order effects.

DISCUSSION

Most importantly, we found that the general tendency to approach (versus avoid) the attachment figure (relative to the acquaintance) was stronger when a distressing context was induced compared to a non-distressing context. These data confirm our prediction that the priming of a distressing context automatically increases behavioural strategies oriented towards the attachment figure. We also found evidence for individual differences in proximity-seeking tendencies. Overall, the analyses revealed that attachment anxiety was related to faster approach (versus avoidance) responses towards the attachment figure (relative to an acquaintance) and this relation was not influenced by the type of prime condition. This result reflects the assumed hyperactive attachment system of anxiously attached individuals, which is characterized by constant and excessive efforts to gain the proximity of the attachment figure in any kind of situation, whether it is a threatening one or not (e.g. Mikulincer & Florian, 1998; Mikulincer et al, 2000). Note, however, that we have to be careful in interpreting the lack of interaction effects because this might be attributed to the small sample sizes (n = 30 in the separate samples) and the resulting lack of power.

Attachment avoidance, on the other hand, was not related to the approach-avoidance index. This result came rather unexpected, especially because the avoidance dimension is considered to be crucial in determining the motivational orientation of behavioural strategies (Fraley & Shaver, 1998, 2000). In addition, we did not find the expected interaction effect between prime condition and attachment avoidance. As such, we could not confirm the hypothesis that only a distressing context will evoke an avoidance response in avoidantly attached individuals, whereas a non-distressing context is assumed to evoke a normative reaction (i.e., approaching the attachment figure) (e.g., Mikulincer & Shaver, 2003). A possible explanation for this lack of results regarding attachment avoidance could be the nature of the threat prime. That is, separation from the attachment figure is an explicitly attachment-related threat context that may be defensively suppressed in avoidant individuals. Research has shown that, in the case of attachment threat, deactivating strategies can act pre-emptively, that is,

precluding attachment-related distressing material from further cognitive processing in an attempt to prevent attachment system activation (Fraley & Shaver, 1997, Fraley, Garner, & Shaver, 2000, Mikulincer & Shaver, 2003). Because of this pre-emptive strategy, it could be that participants scoring higher on attachment avoidance do not experience distress in response to a separation threat, which would imply that no coping actions are required and thus no distance goals are being activated. We therefore designed a second study in which we used a different prime, one that induces an attachment-irrelevant and non-interpersonal threat context, namely academic failure. This specific prime is useful for circumventing the defensive reactions of avoidantly attached individuals. Given that avoidant individuals' defensive system is organized around their strong need for self-reliance and self-promotion, it has been argued that any kind of situation that threatens their self-esteem is likely to cause distress in avoidant individuals (Mikulincer et al., 2002; Mikulincer & Shaver, 2003). An attachment-unrelated prime such as failure is also useful for excluding an alternative interpretation of our findings. This alternative interpretation is related to the fact that the threat prime in Experiment 1 focused on thoughts about the attachment figure, which might have been sufficient to activate attachment-related goals of proximity, regardless of the experience of threat (see Gillath et al, 2006). Hence, to explicitly investigate the effects of threat versus no threat on the automatic tendency to approach the attachment figure while controlling for influences of attachment figure-related thoughts, we asked our participants in the second experiment to think about not passing their final exams at university.

EXPERIMENT 2

METHOD

Participants

Sixty students (44 women, 16 men) from various faculties at Ghent University participated in the experiment. Each participant received 5 euros for their participation. The average age of participants was 20.53 years old, ranging from 18 to 35. None of them had participated in the previous experiment. As in

the first experiment, participants were randomly divided into two conditions. The scores of one subject were removed from the analyses because of extreme values (i.e., more than 3 SD above the general mean) on the ECR-Anxiety scale. The remaining sample consisted of 30 participants in the non-threat prime condition and 29 participants in the threat prime condition.

Procedure

The second experiment followed the exact same procedure as the first one, except for the nature of the priming task. Instead of the separation prime, we presented our participants with an attachment-unrelated threat prime. More specifically, participants were asked to imagine failing their final exams and consequently failing to obtain their degree, and then had to write about related thoughts and feelings. Participants in the non-threat prime condition received the same prime as in the first experiment, namely describing a typical Tuesday. Again, the two subscales of the ECR-R were found to be highly reliable ($\alpha = .94$ for the Anxiety subscale and $\alpha = .84$ for the Avoidance subscale).

RESULTS

A repeated measures ANOVA with compatibility as a within-subjects variable and prime condition as a between-subjects variable revealed a significant main effect of compatibility, $F(1, 57) = 94.81$, $p < .01$ (Table 1). The main effect of prime condition, $F(1,57) = 5.31$, $p < .05$, and the interaction effect between compatibility and prime condition, $F(1, 57) = 8.31$, $p < .01$, also reached significance. Similar to the first experiment, participants reacted faster in the compatible task ($M = 827$ms, $SD = 178$) than in the incompatible task ($M = 1004$ ms, $SD = 209$) and reaction times were significantly faster in the non-threat condition ($M = 864$ ms, $SD = 179$) compared to the failure threat condition ($M = 968$ ms, $SD = 192$). The significant interaction effect indicated that participants displayed stronger approach tendencies after priming a failure threat context ($M = 231$ ms, $SD = 162$) compared to a non-threat context ($M = 125$ ms, $SD = 115$).

To explore the contribution of attachment styles on approach-avoidance tendencies, we performed hierarchical regression analyses on the approach-

avoidance index with prime condition, attachment anxiety, attachment avoidance and their interaction terms as predictors. The model with prime condition and attachment scores together accounted for a significant portion of the variance in approach-avoidance responses, R^2 = .50, p < .01. Concretely, a significant main effect emerged of prime condition, β = .37, p < .01, d = .81, a marginally significant main effect of attachment anxiety, β = .25, p = .06, d = .51, and a significant main effect of attachment avoidance, β = -.27, p = .05, d = .54. The interaction effect between attachment anxiety and avoidance did not reach significance, t < 1, d = .33. In the second step, the interactions between prime condition and attachment anxiety, and prime condition and attachment avoidance did not add significantly to the prediction of approach-avoidance responses, ΔR^2 = .02, p > .10, ts < 1, ds < .28. As in Experiment 1, the above reported associations were not influenced by task order effects, ts < 1.

DISCUSSION

The findings of Experiment 2 replicated and extended those of Experiment 1. In general, we found that approach (versus avoidance) responses towards the attachment figure (relative to an acquaintance) were stronger in a distressing context compared to a non-distressing context. Hence, the priming of an attachment-*unrelated* threat context yielded the same effect on the normative functioning of the attachment system as the priming of an attachment-*related* threat, providing further support for the hypothesis that threat automatically activates stronger approach tendencies towards the attachment figure.

With regard to individual differences in approach-avoidance tendencies, we found that higher scores on attachment avoidance were associated with a weaker tendency to approach the attachment figure, which is consistent with theoretical ideas and empirical findings (Fraley & Shaver, 1998; Mikulincer & Shaver, 2003). Contrary to our expectations, however, this relation was not influenced by the type of prime condition, which suggests that higher scores on attachment avoidance are associated with a weaker tendency to approach the attachment figure irrespective of the presence of threat. This seems at odds with the theoretical assumption that the deactivating strategies of avoidantly attached individuals counteract the tendency to approach the attachment figure only when feeling distressed. The findings on attachment anxiety replicated those of

Experiment 1. That is, attachment anxiety was related to a stronger tendency to approach the attachment figure and this relation was not influenced by the type of prime condition. These findings provide additional evidence for anxious individuals' chronic activation of (excessive) proximity-seeking tendencies in both stress and non-stress contexts (Mikulincer & Florian, 1998). Note, however, that the lack of interaction effects between prime condition and both attachment anxiety and avoidance should be interpreted with caution because the power to detect statistically significant interactions was rather low. Recall that our test had a power of only .12 to detect a small effect ($d = .20$) and a power of .61 to detect a medium effect ($d = .50$).

GENERAL DISCUSSION

The primary objective of the present studies was to investigate a core assumption of attachment theory by conceptualising proximity seeking as a motivational action tendency that operates in an automatic mode. In general, our results showed that a distressing context automatically evokes stronger approach responses towards the attachment figure, regardless of whether the source of distress was attachment-relevant or attachment-irrelevant and regardless of one's attachment style. Secondly, our findings indicated that individual differences in attachment anxiety and avoidance are associated with the predicted patterns of approach-avoidance tendencies: Attachment anxiety was related to a stronger tendency to approach the attachment figure (Experiments 1 and 2), whereas attachment avoidance was related to a weaker tendency to approach the attachment figure (Experiment 2).

Across both studies, we found that the tendency to approach (versus avoid) the attachment figure (relative to an acquaintance) was significantly stronger in a distressing context compared to a non-distressing context. This finding supports the core idea in attachment theory that threat automatically activates a stronger proximity-seeking tendency towards the attachment figure (Bowlby, 1973; Mikulincer & Shaver, 2003; Shaver & Mikulincer, 2002). Furthermore, this pattern of results was found regardless of individual differences in attachment orientation, which is in line with other studies demonstrating the normative functioning of the attachment system under conditions of threat (Mikulincer et al., 2000; Mikulincer et al., 2002). Another important finding of the present

study is that the approach response towards the attachment figure could be replicated using two different threat primes: an attachment-relevant (i.e., separation) and an attachment-irrelevant (i.e., failure) threat context, which is consistent with theoretical predictions (Bowlby, 1969; Mikulincer & Shaver, 2003) and empirical research on attachment system activation (e.g., Mikulincer et al., 2002). That is, every event that is perceived as threatening is assumed to activate the attachment system and these triggers include both attachment-related and -unrelated sources of threat. On a side-note, we want to remark that our results do not imply that distress-alleviating functions necessarily need to be salient for proximity-seeking tendencies to occur. That is, we primarily demonstrated that these approach responses were *stronger* in a distressing compared to a non-distressing context. One can imagine, of course, that people can seek proximity for affiliative or sexual reasons as well.

Both studies could also provide evidence on attachment-style differences in behavioural responses towards the attachment figure. In both Experiments 1 and 2, we found that attachment anxiety was related to heightened approach (versus avoidance) responses towards the attachment figure (relative to an acquaintance). This finding confirms the theoretical assumption that anxious individuals make insistent attempts to seek and maintain proximity towards their attachment figure. Furthermore, the results of both experiments suggested that the relation between attachment anxiety and approach-avoidance tendencies did not depend on the presence of threat. This finding is in line with the general idea that anxious individuals are chronically preoccupied with attachment concerns and tend to appraise 'objectively' safe situations as being threatening (Mikulincer & Florian, 1998; Mikulincer et al., 2000; Shaver & Hazan, 1993). It also fits with other empirical research showing a main effect of attachment anxiety on the accessibility of attachment figure representations following the priming of a separation threat, failure threat, and neutral context (Mikulincer et al., 2002). On the other hand, the lack of interaction contradicts the findings of another study by Mikulincer and colleagues (2000) that examined the effects of stress on the accessibility of proximity-related thoughts. In these studies, an interaction effect was found between prime condition and attachment anxiety, indicating heightened accessibility of proximity words (compared to secure and avoidant attachment) only in the neutral prime condition, but not in the stress prime condition. The divergence in results between our study and that of

Mikulincer et al. (2000) could possibly be explained by the different tasks used and the differences in focus, namely proximity seeking as a *behavioural* action tendency in the present study (symbolic movements in the SRC task) versus proximity-related *thoughts* in the Mikulincer et al. study (reacting to words in the lexical decision task). This difference in operationalisation impairs a straight comparison between the results of both studies, because what people think and what they tend to do is not always likely to converge. We will return to this in the following paragraph.

With regard to attachment avoidance, only the second experiment yielded the expected pattern of results, namely a weaker tendency to approach the attachment figure. This illustrates avoidant individuals' tendency to downplay attachment needs by deactivating the attachment system. On the one hand, this finding is in line with attachment theory and the findings of self-report and behavioural observation studies (e.g., Fraley & Shaver, 1998). On the other hand, it does not fit well with previous social-cognitive research demonstrating preconscious activation of proximity-related themes in avoidant individuals after being primed with distress (Mikulincer et al., 2000). The results on attachment avoidance are also inconsistent with another study by Mikulincer et al (2002) that showed lower accessibility of attachment figure representations in a separation threat context, whereas the present study found decreased approach responses in the failure and neutral context of Experiment 2, but not in the separation context of Experiment 1. Again, the focus on semantic knowledge versus action tendencies could provide a plausible explanation for the divergence in results between our study and that of Mikulincer. It is possible that avoidant individuals do experience preconscious activation of proximity needs, but these may not necessarily translate into behavioural action tendencies because of past failures to attain security through proximity seeking. In other words, they may want, yet simultaneously, fear closeness with the attachment figure because the latter has been associated with rejection and abandonment, and over the course of years this may have resulted in the development of distance instead of proximity goals. The latter conclusion has been substantiated by research on automatic goal-pursuit in which attachment avoidance was found to be associated with a stronger implicit motivation for distance goals (Dewitte & De Houwer, *submitted*, Gillath et al., 2006). Drawing on this line of reasoning, we thus argue that the present results do not contradict, but rather complement the

results of Mikulincer et al. (2000, 2002). To explain the finding that a failure threat did elicit the expected avoidance response in avoidant individuals whereas a separation threat did not, we refer to the nature of the threat prime. Separation involves a disruption of proximity maintenance, so there is no need for avoidant individuals to defend themselves by keeping distance and independence. Failure, on the other hand, is more likely to create distress in avoidant individuals because it undermines their sense of self-worth and self-efficacy, which may encourage them to restore their sense of control through the inhibition of proximity seeking (see Mikulincer, 1998).

The latter assumption does, however, imply that the inhibition of proximity seeking in the case of attachment avoidance should be evident only in the context of distress; yet, this could not be confirmed by the present results. Instead, a main effect of attachment avoidance was found, suggesting that these individuals tend to inhibit approach responses towards the attachment figure in both distressing and non-distressing contexts. This could raise the question why we did not find an avoidance response in the first experiment, especially because the same neutral prime was used in Experiments 1 and 2. In addressing these issues, we need to consider some limitations of the present study that may complicate the interpretation of our findings. First, we have to be careful in interpreting the lack of interaction effects between prime condition and attachment style, because this might be due to the small sample sizes in the separate prime conditions, which has limited the power to detect statistically significant interaction effects. Also note that the small sample size did not allow us to test the hypothesis that attachment security (i.e., low on attachment anxiety and avoidance) is related to heightened approach responses particularly in a threat context, because this would have required testing a three-way interaction between attachment anxiety, avoidance, and prime condition.[2] The statistical power of the present experiments was, however, not sufficient to test higher-order effects. On the other hand, it is worth noting that we did find fairly

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[2] Regarding the lack of relationship between attachment security and the approach-avoidance index, it is also important to note that some researchers (e.g., Fraley et al., 2000) have argued that the ECR is better able to capture the high ends of the anxiety and avoidance dimensions than it does the low (or secure) ends of each dimension, which would imply that the ECR may not be as sensitive for assessing attachment security (we will return to this in the General Discussion of this dissertation).

consistent results in two consecutive experiments, despite these small sample sizes, which seems to suggest that our results are reliable and theoretically meaningful.

Another remark concerns the relative nature of the SRC task used in the present study. The compatible and incompatible blocks are always defined in terms of symbolic movements towards or away from the attachment figure *relative to* the non-attachment figure. Hence, it is difficult to disentangle whether our results reflect stronger approach responses towards the attachment figure or faster avoidance responses away from the acquaintance. However, we believe that it is most plausible to interpret our results in terms of approach responses towards the attachment figure, because it is rather difficult to justify theoretically that an acquaintance would evoke proximity or distance motives. In relation to the previous remark, it can also be argued that an attachment figure and an acquaintance differ not only on the crucial attachment dimension, but also in terms of familiarity, cognitive accessibility, relationship closeness, etc. This may introduce some ambiguities for interpreting our results. However, the observed relationships between the approach-avoidance index and individual differences in attachment style do seem to indicate that it is indeed the relevance for attachment goals that is the crucial difference between both categories of stimuli. Furthermore, the fact that our studies yielded results compatible with attachment theory and other studies on automatic attachment-system activation validates the present method as providing evidence on the impact of attachment on approach-avoidance tendencies.

In general, our results provided several new insights on attachment-style differences in the tendency to approach or avoid the attachment figure, especially with regard to attachment anxiety. That is, previous observational research revealed that only variation in attachment avoidance was related to actual behavioural strategies, whereas attachment anxiety was unrelated to proximity seeking (e.g., Collins & Feeney, 2000; Fraley & Shaver, 1998; Rholes, et al, 2002; Simpson, et al., 1992). As a result, attachment anxiety has often been referred to as an appraisal dimension that is primarily related to distress-reactions (Fraley & Shaver, 1998). The present studies, in contrast, did demonstrate an association between attachment anxiety and behavioural responses because we operationalized proximity seeking as an *automatic* action tendency. This seems to suggest that anxious individuals' motivation for

closeness and intimacy is primarily operating at the automatic level and this fits with research on automatic goal-pursuit in which attachment anxiety was found to be associated with proximity goals (e.g., Gillath et al., 2006; Rom, & Mikulincer, 2003). An explanation in terms of automatic processes may thus clarify why our SRC task could tap the expected approach responses in anxious individuals, whereas observational methods could not. Within the SRC task, the tendency to seek or avoid proximity towards the attachment figure is inferred from the speed of symbolic approach and avoidance responses, which is less susceptible to demand effects. Such biases cannot be ruled out in observation studies because proximity seeking behaviour may be influenced by self-presentation issues or conscious deliberation about the expected outcome of this behaviour. In the case of attachment anxiety, the latter could possibly interfere with the actual manifestation of proximity motives, because thoughts about not receiving as much proximity from the attachment figure as one desire may cause ambivalence and inner conflict in anxious individuals, which may eventually detract them from actual seeking proximity. This fits with the idea that anxious individuals are not only highly sensitive to proximity goals, but also to anti-goals such as rejection, separation, and attachment figure unavailability (Mikulincer et al., 2000; Mikulincer & Shaver, 2007).

It is remarkable that anxious individuals continue their approach behaviour, even though they appraise their attachment figure as being unavailable and unsupportive (Collins, 1996; Simpson, Rholes, & Phillips, 1996). A possible explanation for this discrepancy could be that anxious individuals stay committed to proximity goals, despite their negative expectations regarding goal-attainment, because they have no alternative for achieving security due to their sense of self as weak, vulnerable, and incompetent. It is also possible that anxious individuals do not form a univalent, negative view of their attachment figure, because this would imply that proximity seeking is hopeless (which is the avoidant view). Accordingly, the appraisal of the attachment figure in anxious individuals may vary depending on their current goal-state (see also Pietromonaco & Barrett, 1997, 2006). When confronted with distress, it may be that anxious individuals' underlying proximity motive makes more accessible the positive aspects of the goal-helpful object (i.e., the attachment figure) while inhibiting its negative aspects (see Moors & De Houwer (2001, 2004; also see Ferguson & Bargh, 2004). In other words, the pursuit of intimacy goals in

anxious individuals may automatically render the attachment figure approach-friendly and facilitate goal-consistent behaviour (i.e., proximity seeking).[3] Future work is needed to elaborate on these ideas and to explore them further in systematic research. In addition, more direct tests are needed to investigate the influence of attachment schemas on motivation, goals, and action tendencies measured at the automatic level, because this may advance our understanding on the underlying dynamics of attachment behaviour.

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[3] It is worth noting that the approach-avoidance SRC task has originally been applied as an implicit measure of valence evaluation. Accordingly, the observed relationship between attachment anxiety and approach responses may indicate that anxious individuals hold a positive implicit evaluation of their attachment figure. This is, however, not in line with empirical findings showing that both anxious and avoidant individuals evaluate their attachment figure as being unavailable, inattentive, unsupportive, and insensitive to one's needs (for a review, see Mikulincer & Shaver, 2007). A possible explanation for this affect-behaviour incompatibility could be found in the distinction between 'affective' and 'motivational' valence. According to Robinson and Berridge (1993, 2001), both types of valence represent independent aspects of incentive motivation, which may explain why some stimuli produce goal-directed approach behaviour in the absence of subjective liking. In the case of attachment anxiety, it is not unlikely that one has learned to depend and rely on the attachment figure for protection and security because of the belief that one cannot handle threats on his/her own. Consequently, the attachment figure becomes a particularly salient stimulus and close contact with this person becomes very attractive, wanted, and essential for survival, eliciting a strong tendency to approach the attachment figure. Drawing on the distinction between 'affective' and 'motivational' valence, it can thus be speculated that the SRC task is primarily measuring a 'wanting' component rather that subjective 'liking'. This hypothesis is worth exploring in future research.

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PART II

ATTACHMENT REPRESENTATIONS

CHAPTER 5

PROXIMITY AND DISTANCE GOALS IN ADULT ATTACHMENT[1]

ABSTRACT

In three experiments, we used a variant of the Implicit Association Test (IAT) and explicit reports to examine the assumption that attachment anxiety and avoidance are related to proximity and distance goals. Results confirmed that higher scores on attachment avoidance are associated with a stronger implicit motivation for and positive evaluation of distance goals in attachment relationships. This was found both at the implicit and explicit level and both in a stress and non-stress context. Attachment anxiety was associated with proximity goals only when measured explicitly, but not when goal-activation was measured implicitly. Our findings highlight the importance of considering both implicit and explicit goal-representations when studying motivational processes in the context of attachment, and suggest that the IAT can provide a useful tool for investigating implicit motivational constructs.

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[1] Dewitte, M., & De Houwer, J. Proximity and distance goals in adult attachment. *Manuscript submitted for publication*.

INTRODUCTION

As human beings, we all have an innate need to be close to someone. Yet, sometimes this desire for proximity can become deregulated by past failures to obtain closeness, support, and intimacy. As a result, some of us strive for the very opposite, and prefer to spend time and space alone. Others, in contrast, crave intimacy and desperately try to minimize distance from the one they love with a risk of ultimately 'suffocating' them. The present study aims at studying such discrepancies in the regulation of closeness and distance by measuring the attitudes towards and implicit motivation for interpersonal closeness and distance as a function of individual differences in attachment style.

Attachment-Related Differences in Proximity and Distance

Attachment theory (Bowlby, 1969, 1982) offers a coherent theoretical framework for explaining individual differences in closeness-distance regulation. According to the theory, perceived threats and dangers make salient the interpersonal goal of gaining proximity and support from the attachment figure, which encourages the implementation of behavioural plans aimed at attaining safety and support. Although the attachment behavioural system serves the broad goal of felt security, 'a person's history of achieving or failing to achieve this goal is expected to result in a characteristic hierarchy of attachment needs' (Collins, Guichard, Ford, & Feeney, 2004, p. 204). In relation to this, it has been theorized that, depending on one's expectations about how the attachment figure is likely to respond, people will adopt different goals, plans, and behavioural strategies aimed at minimizing or maximizing proximity towards the attachment figure. The expectations, beliefs, goals, and plans that evolve out of repeated experiences with the attachment figure are stored in mental working models that shape cognitive, emotional, and behavioural responses in attachment relationships. According to attachment theory, proximity and distance goals constitute one of the most important components of attachment working models, because these goals are assumed to be most influential in directing the appraisal of emotion-eliciting events, the processing of attachment-related information, and the planning of one's behaviour in social situations (e.g., Mikulincer & Shaver, 2007). As such, proximity and distance goals are highly relevant for both

intra- and interpersonal regulation, which points to the importance of studying these goals in the context of adult attachment.

Individual differences in attachment working models serve as the basis for individual differences in attachment style. Accordingly, important attachment-style differences can be expected in the pursuit of interpersonal closeness and distance. Attachment styles are commonly described and measured in terms of two dimensions of attachment insecurity, namely anxiety and avoidance (Brennan, Clark, Shaver, 1998; Fraley & Waller, 1998). Individuals who are neither anxious or avoidant (i.e., secure) have a history of interactions with available and responsive attachment figures, which leads to the development of optimistic expectations about stress manageability, a strong sense of self-efficacy (Mikulincer & Florian, 1995), and confidence in others good intentions (Bartholomew & Horowitz, 1991). As such, secure individuals have no difficulties in depending on and seeking support from others and can flexibly move along the proximity-distance continuum depending on the situational and relational context. Insecure individuals, in contrast, are less able to balance closeness and distance within their relationships. Because of their history of attachment figure unavailability, in which they have repeatedly experienced that proximity goals and associated action tendencies failed in achieving security, they needed to reorganize their goal-system. Anxious individuals stay committed to proximity goals and are compulsively driven to fulfil their unmet attachment needs of closeness and interdependence. Given their deep-rooted sense of helplessness and disbelief in their own lovability, these individuals tend to overemphasize their need for closeness and co-regulation, and overly rely on proximity-seeking tendencies. Avoidant attachment, on the other hand, is characterized by a tenacious belief that others are unreliable and unavailable when needed. As a defence, these individuals have disengaged from proximity goals and primarily aim at deactivating the attachment system by dismissing distress-cues and inhibiting proximity seeking behaviour through the pursuit of autonomy and control. Being reluctant to count on others for support, they aim at maximizing physical and psychological distance from the attachment figure, tend to minimize the importance of closeness, and promote a strong sense of self-reliance and independence (see Mikulincer & Shaver, 2007).

From the above description on attachment-related differences, it is clear that attachment theory places great emphasis on the representation of motivational

elements related to proximity and distance. These goals are most likely to differ between anxious and avoidant individuals and may lead them to construe and respond to similar situations in very different ways. Although several theorists have discussed their significance in attachment working models (e.g., Collins & Read, 1994; Collins, et al., 2004; Pietromonaco & Barrett, 2000), there is little empirical work that directly assesses the goal-structures associated with different attachment styles.

Existing Research on Proximity and Distance Goals in Adult Attachment

Traditionally, research has relied on self-report measures to examine the assumption that attachment anxiety and avoidance differ in the content and expression of proximity and distance goals. Consistent with theoretical predictions, it has been shown that anxious individuals report higher levels of interdependence, intimacy, and willingness to self-disclose, whereas avoidant individuals show the opposite pattern (e.g., Collins & Allard, 2001; Griffin, & Bartholomew, 1994; Mikulincer & Nachson, 1991; Shaver & Hazan, 1993). These self-report studies have, however, important drawbacks. A first concern involves the issue of common method variance and procedural item-overlap. That is, the questionnaires that have been used to measure proximity and distance in close relationships show a high similarity with the questionnaires measuring attachment anxiety and avoidance, which also include items on self-disclosure, dependence, and (dis)comfort with closeness (e.g., Bartholomew & Horowitz, 1991; Brennan, Clark, & Shaver, 1998; Collins & Read, 1990). Because of this item-overlap, it is thus not surprising that most self-report studies have confirmed the predicted relationships between attachment styles and proximity seeking, especially when both types of questionnaires are administered in the same session. Secondly, self-report measures are susceptible to self-presentation strategies and are limited to the study of conscious and reportable experiences (e.g., Greenwald, & Banaji). Although people may be aware of the goals they typically pursue to regulate attachment behaviour, it has been argued that the pursuit of attachment goals becomes solidified through repeated experiences and increasingly automatized over time (e.g., Collins et al, 2004). Accordingly, self-report measures can reveal only partial information on proximity and distance goals, because the latter can also be triggered and

pursued without conscious planning. This is congruent with Bargh's (1990) auto-motive model, in which goals are described as mental representations that can be preconsciously activated and can guide behaviour without conscious awareness, intention, effort, and control (e.g., Dijksterhuis & Bargh, 2001).

Because of these limitations of self-report measures, researchers have recently started to rely on reaction time paradigms that allow investigating the implicit features of attachment working models. Also with regard to the study of goals and needs, such implicit measures have proven to be useful for examining the *automatic* goal-related cognitions associated with attachment anxiety and avoidance. Summarizing the main results of these studies, it has been found that anxious individuals pursue extreme closeness and security, whereas attachment avoidance is associated with the goal of maintaining control and interpersonal distance as a means to avoid intimacy and dependence (e.g., Gillath, Mikulincer, Fitzsimons, Shaver, Schachner, & Bargh, 2006; Rom, & Mikulincer, 2003). Although research using implicit measures has revealed important information on the relation between adult attachment and automatic goals, there are still some issues that call for further research. First of all, only a small number of studies have examined automatic goal-activation in the context of attachment. This is surprising when considering that goals are essential in the regulation of attachment behaviour. Secondly, most of this research has relied on the lexical decision task, which is just one possible tool for identifying the goals associated with attachment strategies. Moreover, in the lexical decision task, the activation of goals is inferred from the extent to which goal-related concepts are cognitive accessible, which can provide only a static and remote index of the presence of goal-related representations. Therefore, we argue that research on attachment goals could benefit from the use of other implicit measures that tap more directly into automatic motivational processes and that are able to capture the dynamic component of goal-related cognitions. A final concern involves the observation that most of the research on automatic attachment goals has investigated these goals within a specific context or after presenting specific primes. For example, studies have examined (a) the pursuit of proximity-goals after priming the name of the attachment figure (Gillath, et al., 2006), (b) attachment goals within the context of new relationship development (Bartz & Lydon, 2006), (c) trust-related goals (Mikulincer, 1998), and (d) the manifestation of goals within group contexts (Rom & Mikulincer, 2003). Given that the manipulation of (prime)

context is likely to influence the activation or inhibition of goal-related cognitions, it is important to also explore attachment-style differences in proximity and distance goals within a neutral context. In other words, research is needed that specifically focuses on individual differences in automatic proximity and distance goals as a study object in itself.

The Present Study

At present, few empirical studies have directly assessed the implicit goal-representations that are stored in attachment working models and none systematically compare explicit and implicit behavioural goals in relation to attachment style. The aim of the present studies was to address this need for additional research. For this purpose, we used a variant of the Implicit Association Task (IAT; Greenwald, McGhee, & Schwartz, 1998) to measure attachment-related differences in the implicit motivation and attitudes towards proximity and distance. More specifically, we adapted the IAT in such a manner that it would measure, in a non-verbal way, the extent to which proximity and distance goals are *wanted* and *liked*. As such, the IAT can provide a more direct test of the automatic goal-representations that are assumed to be associated with attachment anxiety and avoidance. Furthermore, the IAT has proven to outperform other implicit measures in terms of reliability and effect size (e.g., De Houwer & De Bruycker, 2007). Note that variants of the IAT have already been used successfully in the context of adult attachment (see Banse & Kowalick, 2007, and Zayas & Shoda, 2005 who used the IAT to assess automatic evaluations of self and others as a function of attachment style).

In addition to the measurement of implicit behavioural goals, the present studies also aimed at examining the relation between attachment style and self-reported proximity and distance; yet, in a way that precludes problems of shared method variance and item-overlap. We therefore used pictorial measures and rating scales tapping directly into one's preferred and actual proximity-distance tendencies towards the attachment figure, and explored whether previous self-report findings could be verified. Because this is the first study using a motivational IAT to assess implicit goal-representations, we were also interested in examining the association between the IAT and the explicit closeness-distance indices. Although the IAT and self-report measures are believed to tap different

aspects of a specific construct, one can assume that these aspects are related to a certain extent (e.g., Hofmann, Gawronski, Gschwender, Le, & Schmitt, 2005). Hence, if we would observe a correlation between the IAT and explicit reports of proximity-distance, this would support that the IAT can be used to assess automatically activated goal-representations.

In the present paper, three experiments are reported that investigate attachment-style differences in implicit and explicit motivation and attitudes towards proximity and distance. Experiment 1 explored this relationship within a neutral context using a personalized motivational IAT in combination with self-reported indices of closeness-distance. In the second experiment, we examined whether the association between attachment style and proximity-distance motives would differ after priming a distressing context. Finally, Experiment 3 adopted a traditional IAT to measure the automatic evaluation of proximity and distance goals as a function of attachment style. Specific predictions will be made when discussing each of the experiments separately.

EXPERIMENT 1

The main objective of Experiment 1 was to examine the relation between attachment anxiety and avoidance and their underlying proximity and distance goals within a neutral context. These goals were measured at the implicit level using a motivational variant of the IAT. Because motivational processes necessarily invoke personal associations, we adopted a personalized version of the IAT, which we created by changing the *positive* and *negative* labels of the traditional IAT into *I want* and *I don't want* in combination with omitting the error feedback (see Olson & Fazio, 2004). These labels have the added value that they can capture the dynamic component of goal-pursuit and goal-representations, namely *wanting* to attain proximity or distance. In addition to the IAT, participants also completed a series of explicit measures tapping into their consciously reportable judgments of closeness and distance.

We were specifically interested in exploring whether the results of previous research on automatic goal-activation can be replicated within a neutral context and using another method than the lexical decision task. On the basis of both attachment theory and research on self-reported and automatic goals, we expect that higher scores on attachment avoidance will be related to a stronger

motivation for interpersonal distance, whereas attachment anxiety should be associated with a stronger motivation for proximity towards the attachment figure. On the one hand, we predict that the assumed relationships will emerge both at the implicit and explicit level. On the other hand, it can also be expected that, especially in the case of attachment avoidance, explicit responses will differ from automatic responses. In relation to this, several studies have demonstrated that avoidant individuals sometimes fail to achieve their deactivating goals (i.e., interpersonal distance) and reveal their underlying attachment needs (i.e., proximity) when these are measured at the automatic level (Mikulincer, 1998; Mikulincer, Birnbaum, Woddis, Nachmias, 2000).

METHOD

Participants

Forty-nine first year psychology students from Ghent University participated in return for extra course credit.

Materials

Attachment style was measured using a Dutch translation of the ECR-revised (Experiences in Close Relationships scale revised; Fraley, Waller, & Brennan, 2000; ECR-R-NL, Buysse & Dewitte, 2004). This 36-items questionnaire is designed to assess the two attachment dimensions of anxiety and avoidance. Participants rated the extent to which each item is descriptive of their experiences with their primary attachment figure, using a 7-points scale ranging from *not at all* to *very much*. Eighteen items tap fear of abandonment and strong desires for interpersonal merger (Anxiety) and another 18 items assess discomfort with closeness, dependence, and intimate self-disclosure (Avoidance). Both scales have proven to be internally consistent and adequate in terms of construct validity. In the current sample, Cronbach's alphas were high for the Anxiety (.93) as well as for the Avoidance subscale (.93).

Self-report measures of proximity and distance. As a self-report index of proximity and distance tendencies, participants were asked to rate the extent to

which they prefer proximity and distance in their attachment relationship, using two separate 7 points-scales ranging from *not at all* to *very much*. Higher scores reflect a higher preference for, respectively, interpersonal distance and proximity towards the attachment figure. Additionally, a relative proximity-distance measure was created by asking the participants to rate their preference for keeping distance or seeking proximity towards the attachment figure on a scale ranging from 1 *(distance keeping)* to 7 *(proximity seeking)*. Because the IAT can provide only a relative proximity-distance score, this measure allows for a direct comparison between one's implicit and explicit motivation to seek proximity or keep distance from the attachment figure.

Next, the Inclusion of the Other in the Self Scale (IOS; Aron, Aron, & Smollan, 1992) was administered. The IOS is a widely used pictorial measure of closeness that has proven to asses both feeling and behaving close, has shown good psychometric qualities, and is less susceptible to social desirability responses than other closeness-questionnaires. The latter makes the IOS-scale particularly useful in terms of the present research. Participants were instructed to select the picture that best described their attachment relationship from a set of Venn-like diagrams showing different degrees of overlap between two circles (I and other). These circles progresses linearly, creating a seven-step scale. Higher scores reflect higher levels of interconnectedness and perceived oneness.

As a final index of interpersonal closeness, participants were presented with a diagram consisting of 10 concentric circles with in the middle the word 'I' (also see Rowe & Carnelley, 2005). Participants were asked to name the three most important persons in their lives (beginning with the attachment figure) and were instructed to place them in the diagram according to how much closeness they experience between themselves and the named person. The attachment figure was the primary variable of interest. Lower scores reflect a higher level of closeness between the self and the attachment figure.

The IAT. The items for the IAT were four *positive* (i.e., humour, health, gift, peace) and four *negative* (i.e., hate, war, illness, pain) words, taken from a normative evaluation study of Dutch words (Hermans & De Houwer, 1994), and four *proximity* (i.e., nearby, intimacy, hug, close) and four *distance* (i.e., separation, independent, autonomous, distant) words that were drawn from the attachment literature. Word stimuli were presented in the centre of a black screen

using white uppercase letters in an Arial font with a font size of 32. As IAT labels, we used the Dutch words for *proximity, distance, I want,* and *I don't want*. The IAT was programmed and presented using the INQUISIT Milliseconds software package (INQUISIT 2.01, 2005) on a Pentium II computer with a 15-inch colour monitor.

Procedure

After signing the informed consent, the primary attachment figure of each participant was identified using the WHOTO scale, which consist of 6 questions referring to the proximity-seeking, safe haven and secure base functions of an attachment figure (Hazan & Zeifman, 1994). For each question, participants had to write the name of the person that best served each of these functions. The person that satisfied the larger number of attachment-related functions was labelled as the primary attachment figure (see Fraley & Davis, 1997).

Next, the IAT was administered. In accordance with Greenwald et al. (1998), the IAT consisted of five blocks in which participants were instructed to categorise words as quickly as possible into different categories by pressing a left (Q) or right (M) key on the AZERTY keyboard. The items were presented equally often in a random order. To minimize error variance, the order of the blocks within each IAT was kept constant for all participants (see Hofmann et al., 2005). In the first block, participants discriminated attribute-items by pressing a right key for *proximity*-words and a left key for *distance*-words. Next, they sorted target-items into the *I want* (right) and *I don't want* (left) categories. The third stage combined these attributes and targets so that *proximity* and *I want* (right) had to be discriminated from *distance* and *I don't want* (left). Subsequently, the interpersonal words of Block 1 were presented again, but this time the key assignment for *proximity* and *distance* was reversed. The final stage combined targets and attributes in this reversed order so that *distance* and *I want* required a right response and *proximity* and *I don't want* a left response. The single-task blocks (Block 1, 2, and 4) comprised of 24 trials, whereas the dual-task blocks (Block 3 and 5) consisted of two sub-blocks of 48 trials. The IAT-effect was computed by subtracting the mean latencies of the initial combined tasks from the mean latencies of the reversed combined tasks, so that a positive IAT score indicates a stronger association between *proximity* and *I want* (or

distance and *I don't want*) than *proximity* and *I don't want* (or *distance* and *I want*).

An instruction screen at the beginning of the task informed the participants that *proximity* and *distance* referred to, respectively, intimacy and independence with regard to their primary attachment figure. The labels *I want* and *I don't want* were described as involving things one might want or don't want. In addition, each block was preceded by a short instruction of the following task, reminding of the exact key-assignment on the one hand, and the attachment context of the labels on the other hand. A stimulus remained on the screen until a response was registered. In each block, the labels of categories assigned to the left key were printed in the top left corner of the screen, whereas the labels of the categories assigned to the right key were presented in the top right corner of the screen. Labels were presented continuously throughout each block. Once a response was given, the next stimulus appeared after an interval of 400 ms. In accordance with Olson and Fazio (2004), we 'personalized' the IAT by omitting the error feedback. Finally, participants completed a set of self-report questionnaires.

RESULTS

IAT-effect

Data reduction and analyses were consistent with the D600-scoring algorithm recommended by Greenwald, Nosek, and Banaji (2003). Table 1 shows the means and standard deviations of the response latencies on the IAT in milliseconds.[2] To evaluate the internal consistency of the IAT, we divided each combined block into two sub-blocks of equal length (first half and second half) and then calculated difference scores for these two halves. The Spearman-Brown coefficients revealed a good split-half reliability (.78).

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[2] Given that the present studies primarily aimed at identifying individual differences in implicit motivational processes, we did not counterbalance the order of response assignment in the IAT (see Gawronski, 2002; Hoffmann, et al., 2007). Therefore, the IAT-effects cannot be interpreted in absolute terms. Yet, for the interested reader, we do report that participants generally wanted more proximity than distance in their attachment relationships and also evaluated proximity as more positive than distance (Cohen's d ranging from 1.67 to 2.34).

Table 1

Means (in ms) and Standard Deviations of the reaction times on the IAT in Experiments 1, 2, and 3

	M	SD
Experiment 1		
I want - Proximity	684	182
I want - Distance	1078	218
Experiment 2		
I want - Proximity	738	177
I want - Distance	1155	305
Experiment 3		
Positive - Together	692	98
Positive - Apart	1069	205

Relation between Individual Differences in Attachment and IAT

Regression analyses were performed on the D600 IAT score, entering the two attachment scores as predictor variables. In a first step, attachment anxiety and avoidance were centred around their respective means and then entered as predictors in the regression analysis in order to examine their unique main effects on the IAT score. In a second step, we included the two-way interaction between anxiety and avoidance (i.e., product term) as an additional predictor. As can be seen in Table 2, only a significant main effect of attachment avoidance emerged, indicating that higher scores on attachment avoidance are associated with a stronger implicit motivation for interpersonal distance (relative to proximity). There was no significant unique effect of attachment anxiety and no significant interaction effect of anxiety and avoidance.

Table 2

Regression analyses on the implicit and explicit closeness-indices of Experiment 1 with attachment anxiety, attachment avoidance and their interaction term as predictors

Closeness indices	βanxiety	βavoidance	βanxiety x avoidance
IAT proximity-distance	**.13**	**-.31***	**.01**
Self-reported proximity	.25**	-.75***	.12
Self-reported distance	-.29**	.77***	-.19
Relative proximity-distance	-.02	-.78***	.04
IOS	.08	-.77***	.05
Closeness towards the self	-.19	.65***	-.09

* p < .10; ** p < .05; *** p < .01

β = standardized regression coefficient

Relation between Individual Differences in Attachment and Self-Report Indices of Closeness-Distance

Table 2 shows that both attachment anxiety and avoidance were significant predictors of the level of self-reported proximity and distance regarding the attachment figure. In line with theoretical predictions, attachment anxiety was positively related to proximity seeking and negatively related to distance keeping. Attachment avoidance, on the other hand, was associated with a higher preference for distance keeping and a lower preference for proximity seeking. With regard to the relative proximity-distance measure, only a main effect of attachment avoidance emerged, indicating that the more avoidantly attached individuals preferred to keep interpersonal distance relative to seeking proximity. No significant relation was found with attachment anxiety. Attachment avoidance was also significantly related to the IOS-scale and closeness-towards-the self, which demonstrates that individuals scoring higher on attachment avoidance show less interconnectedness with their attachment figure and prefer to keep them at distance. Again, no relation was found with attachment anxiety. Furthermore, none of the closeness indices showed a significant relation with the anxiety x avoidance interaction term.

Relation between the IAT and Indices of Closeness-Distance

As reported in Table 3, the IAT was significantly related to the level of self-reported interpersonal distance and the relative proximity-distance measure. This indicates that the level of implicit motivation for proximity-distance is associated with the level of explicitly reported preference to keep distance from the attachment figure. No significant relation was found with self-reported proximity. In addition, the relation between the IAT and both the IOS-scale and closeness-towards-the-self almost approached significance. This suggests that the stronger one's implicit motivation for proximity, the more interconnectedness and closeness one tends to report at the explicit level.[3]

Table 3

Relation between the IAT and the self-reported closeness-indices in Experiment 1

Self-reported closeness indices	IAT score
Self-reported proximity	.19
Self-reported distance	-.30**
Relative proximity-distance	.30**
IOS	.26*
Closeness towards the self	-.27*

* p < .10; ** p < .05

DISCUSSION

The most important result in terms of the present research is the observed relationship between attachment style and the implicit motivation to seek proximity or distance regarding the attachment figure. Results showed that

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[3] Because several studies (Banse & Gawronski, 2001; Dunton & Fazio, 1997) noticed an increase in correlations between the IAT and questionnaire measures when self-presentation tendencies are controlled for, we presented our participants with the 11 statements of the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1964) to control for these response tendencies. Yet, in none of the three Experiments, controlling for social desirability did affect the pattern of results.

individuals scoring higher on attachment avoidance, already at a relatively automatic level, want more distance than proximity in their attachment relationship. This is in line with theoretical ideas and empirical evidence on attachment-related goal pursuit (e.g., Gillath et al., 2006; Rom & Mikulincer, 2003). In addition, their self-reported need for closeness and distance fitted their pattern of responses on the IAT. That is, a higher level of attachment avoidance was related to a greater preference for distance over proximity, less interconnectedness with the attachment figure, and a greater distance between the self and the attachment figure. Importantly, the finding that distance goals were pursued in the absence of a threat context may possibly indicate that the deactivating strategies of avoidant individuals are chronically organized around their self-protective need to avoid intimacy and keep independence, even when no coping actions are required. Note that this finding may cast doubts about the theoretical assumption that attachment strategies and working models are primarily activated under distressing conditions (see Collins et al., 2004; Mikulincer & Shaver, 2003). Unexpectedly, attachment anxiety did not relate to responses on the proximity-distance IAT and was associated with only two of the five self-reported closeness-distance indices. These findings are at odds with attachment theory and research demonstrating that anxious individuals display a strong desire for proximity and intimacy, also at the automatic level (Mikulincer et al, 2000; Mikulincer & Shaver, 2003; Gillath et al., 2006). Finally, it is noteworthy that the IAT was related to almost all self-report indices of closeness-distance, which provides partial support for the validity of the personalized motivational IAT to assess proximity-distance motives.

EXPERIMENT 2

The unexpected lack of association between attachment anxiety and implicit proximity goals is intriguing, because the search for interpersonal fusion and closeness is generally conceived as a defining characteristic of attachment anxiety. Therefore, we conducted a new experiment aimed at further exploring the relation between attachment style and implicit goals, by inducing a threat-context before administering the IAT. Given that anxious individuals fear loss and abandonment by their attachment figure, it can be expected that their desire for proximity will particularly be triggered by events that make salient their

underlying fear. This is congruent with theoretical accounts of and empirical findings on goal-activation, indicating that the priming of a goal-relevant context enhances the accessibility of goal-related knowledge-structures (e.g., Förster, Liberman, & Friedman, 2007). Accordingly, Experiment 2 explored the possibility that the imagination of being temporally separated from the attachment figure will trigger anxious individuals' motivation to restore this disruption of proximity maintenance. In the case of attachment avoidance, theoretical predictions are less clear. On the one hand, it could be expected that their tendency to pursue distance goals will not be affected by the induction of (attachment) threat. On the other hand, a study by Mikulincer and colleagues (2000), in which a lexical decision task was used with proximity and distance-related words after priming a threat context, has revealed that threat can bypass the avoidant cognitive shield and reveal a need for proximity at the preconscious level (i.e., fast reaction times on proximity words). On the basis of this study, it could thus also be expected that higher scores on attachment avoidance will be associated with a stronger implicit motivation for proximity towards the attachment figure.

METHOD

Participants

Forty-four students from various faculties at Ghent University participated in the experiment. Each participant received 5 euros for their participation. None of them had participated in the first experiment. The scores of one participant were removed because of extreme scores on the ECR (i.e., more than 3 SD above the mean) and another participant was excluded from analyses because he did not complete all the questionnaire items (more than 25 % missing values). The remaining sample consisted of forty-two participants.

Materials and Procedure

Instructions and materials were identical to those of Experiment 1, except that participants were primed with a threat context before completing the IAT. The priming task was described as a visualisation exercise in which participants were

asked to form a vivid image of their attachment figure going abroad for 1 to 2 years. After the visualisation, participants were instructed to write about their thoughts and feelings related to this event. To measure the amount of distress elicited by the separation scenario, 12 visual analogue scales were administered before and after the prime. Participants were asked to place a mark on a 10-cm line, according to how much distress, despair, loneliness, anxiety, sadness, tension, insecurity, hurt, happiness, self-confidence, and joy they experienced *at that moment*, followed by a general evaluation of their current mood. We used continuous line rating scales to make it less likely that participants would remember their responses.

RESULTS

Distress Induction

When comparing the amount of negative and positive feelings (means of the negative and positive VAS scales respectively) reported before and after the visualisation exercise, it appeared that, after the imagination of the attachment figure leaving, participants generally reported more negative feelings, $t(1,41) = 3.72$, $p < .01$, and a less positive evaluation of their current mood, $t(1, 41) = 3.41$, $p < .01$, than before the threat-prime. This indicates that our threat-prime was successful in eliciting distress. To examine the relation between attachment style and the amount of distress elicited by the separation-scenario, we calculated difference-scores between the amount of positive feelings reported before and after the threat-prime and the amount of negative feelings before and after the threat-prime. A significant relationship was found between attachment anxiety and the amount of negative feelings and current mood, indicating that the more anxiously attached individuals reported more negative feelings, $r = .35$, $p < .05$, and a less positive mood in response to an imagined separation, $r = -.28$, $p < .05$. Attachment avoidance, on the other hand, showed no significant relationship with the difference-scores of positive and negative feelings; neither did they report a difference in mood before and after the threat-prime, rs $< .10$, *ns*.

IAT

The mean reaction times on the IAT are presented in Table 1. Again, the IAT was found to be highly reliable (.79).

Relation between Individual Differences in Attachment and IAT

Similar to Experiment 1, only a significant main effect of attachment avoidance emerged, indicating that the more avoidantly attached individuals hold a relatively stronger implicit motivation to keep interpersonal distance in their attachment relationship. Again, no significant relation was found with attachment anxiety and no significant interaction effect between anxiety and avoidance (see Table 4).

Table 4

Regression analyses on the implicit and explicit closeness-indices of Experiment 2 with attachment anxiety, attachment avoidance and their interaction term as predictors

Closeness indices	βanxiety	βavoidance	βanxiety x avoidance
IAT proximity-distance	**.05**	**-.42****	**-.16**
Self-reported proximity	.25**	-.68***	.10
Self-reported distance	-.38**	.58***	.21
Relative proximity-distance	.19*	-.88***	-.04
IOS	.37***	-.67***	.04
Closeness towards the self	-.37***	.78***	-.02

* $p < .10$; ** $p < .05$; *** $p < .01$

Relation between Individual Differences in Attachment and Self-Report Indices of Closeness-Distance

As reported in Table 4, both attachment anxiety and avoidance were significantly related to the level of self-reported proximity and distance. Similar to Experiment 1, attachment anxiety was associated with a greater preference for proximity seeking and a lower preference for distance keeping, whereas

attachment avoidance showed the opposite pattern. The relative proximity-distance measure was also related to both attachment dimensions. Attachment anxiety showed a marginally significant association with the level of preferred proximity seeking (relative to distance keeping). Attachment avoidance, on the other hand, was significantly associated with a greater preference for distance keeping (relative to proximity seeking). Both attachment dimensions were also significantly related to the IOS-scale and closeness-towards-the-self. The observed relationships indicated a higher level of interconnectedness and closeness in the case of attachment anxiety, and a lower level of closeness in the case of attachment avoidance. Again, none of the closeness-measures showed a significant relation with the anxiety x avoidance interaction term.

Table 5

Relation between the IAT and the self-reported closeness-indices in Experiment 2

Self-reported closeness indices	IAT score
Self-reported proximity	.11
Self-reported distance	-.29*
Relative proximity-distance	.35**
IOS	.08
Closeness towards the self	-.27*

*$p < .10$; ** $p < .05$

Relation between IAT and Self-Report Indices of Closeness-Distance

Similar to Experiment 1, the IAT was significantly related to self-reported distance keeping and the relative proximity-distance measure (see Table 5). Results indicated that a higher level of implicit motivation for interpersonal distance was associated with a higher level of explicitly reported distance regarding the attachment figure. Again, no significant relation was found between the IAT and self-reported proximity-seeking. With regard to the other closeness indices, the IAT was associated only with closeness-towards-the-self, indicating that a higher score on the IAT was related to a higher level of reported

closeness between the self and the attachment figure. Unlike to what was the case in Experiment 1, no significant relation was found with the IOS-scale.

DISCUSSION

The results were generally in line with those of Experiment 1. Attachment avoidance was significantly related to the pursuit of interpersonal distance rather than proximity, and this was reflected both in their implicit and explicit responses. On the one hand, these findings contradict those of Mikulincer and colleagues (2000) who demonstrated high accessibility of proximity words in avoidant individuals after priming distress. On the other hand, the search for interpersonal distance instead of proximity does seem to be in line with the theoretical prediction that avoidant individuals automatically activate self-protective distance motives in response to threat (Mikulincer & Shaver, 2003). In relation to the latter, we need to note, however, that our mood-manipulation check did not reveal a significant relationship with attachment avoidance. This lack of relationship could possibly result from the fact that avoidant individuals tend to suppress separation-related thoughts as a means to prevent that attachment needs become salient (Mikulincer, Dolev, & Shaver, 2004; Fraley, Garner, & Shaver, 2000; Fraley & Shaver, 1997). Because avoidant individuals were found to be unaffected by the separation threat prime and because we obtained similar results in a neutral context (see Experiment 1), the automatic activation of distance goals, found in the present study, should probably not be interpreted as an active defensive response against separation distress, but may rather be interpreted in terms of the *chronic* activation of distance goals in avoidant individuals.

For the second time, the expected relationship between attachment anxiety and the implicit motivation to seek proximity towards the attachment figure could not be demonstrated. When measured at the explicit level, on the other hand, the pattern of proximity-distance responses did conform to theoretical predictions. That is, individuals scoring higher on attachment anxiety reported to prefer more proximity and interconnectedness in their attachment relationship. Contrary to the previous experiment, an association was found with almost *all* the self-reported closeness indices. As such, a clear dissociation could be observed between the implicit and explicit responses of anxious individuals. The

lack of association between attachment anxiety and the automatic proximity-response came rather unexpected, especially because we induced a separation context which was expected to increase their motivation to alleviate distress and make salient proximity goals. In relation to this, it is worth noting that our results did confirm that anxious individuals were strongly affected by the induction of separation threat, which may reflect their tendency to ruminate on negative thoughts and focus on their emotional state when confronted with (attachment) threat (e.g., Mikulincer & Florian, 1995).[4] Finally, similar to Experiment 1, the personalized motivational IAT was related to almost all self-report indices of closeness-distance, which provides additional support for its potential to capture implicit motivational constructs.

EXPERIMENT 3

Whereas the previous two experiments focused on a rather dynamic component of goal-pursuit, namely *wanting* to attain the goal of proximity or distance, the third Experiment aimed at examining the *valence* of the end-states of the goals, namely proximity and distance. Provided that goals reflect cognitive representations of the desired outcomes that people want to attain (Bargh & Chartrand, 1999; Custers, & Aerts, 2005), it can be expected that goals will be associated with a positive evaluation. Hence, to the extent that anxious individuals are indeed motivated to maintain excessive closeness towards the attachment figure, they should display a positive attitude towards proximity relative to distance. Avoidant individuals, on the other hand, are expected to value proximity as less positive and distance as more positive. To test these predictions, a traditional IAT was administered, measuring positive and negative associations with regard to proximity and distance within a neutral context. Given that the IAT may be contaminated by extra-personal associations reflecting cultural instead of personal attitudes (see Olson & Fazio, 2004), we used the labels *together* and *apart* because these words are less likely to be construed normatively (compared to the words proximity and distance).

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[4] Note that it is not clear whether this result reflects a greater willingness to report distress in response to separation thoughts or whether anxious individuals actually experience greater distress.

METHOD

Participants

Forty-six students from various faculties at Ghent University were paid 5 euros for their participation in this study. None of them had participated in the previous experiments.

Materials and Procedure

The same procedure and materials were used as in Experiment 1. The only difference was the use of a traditional IAT instead of a personalized one. To measure implicit evaluations of proximity and distance goals, the labels I want and I don't want were replaced by *positive* and *negative*, and the labels proximity and distance were replaced by less clearly positively and negatively valued words, namely *together* and *apart*. The word stimuli were the same as in the previous experiments. Another difference with the personalized version of the IAT was that errors were followed by a red X presented in the middle of the screen for 400 ms. Otherwise, the procedure of the IAT was identical to that of Experiments 1 and 2. A larger score on the IAT indicates a more positive implicit evaluation of proximity (or negative evaluation of distance), whereas a lower score on the IAT indicates a more negative evaluation of proximity (or positive evaluation of distance).

RESULTS

IAT

Table 1 presents the mean response latencies of the IAT. Similar to Experiments 1 and 2, the IAT was found to be highly internally consistent (.86).

Relation between Individual Differences in Attachment and IAT

In line with the results of Experiments 1 and 2, attachment avoidance emerged as the only significant predictor of the IAT score, indicating that higher scores on attachment avoidance were related to a more positive implicit

evaluation of interpersonal distance relative to proximity. No significant relation was found with attachment anxiety and no significant interaction effect of anxiety and avoidance.

Table 6

Regression analyses on the implicit and explicit closeness-indices of Experiment 3 with attachment anxiety, attachment avoidance and their interaction term as predictors

Closeness indices	βanxiety	βavoidance	βanxiety x avoidance
IAT proximity-distance	**-.01**	**.33****	**-.11**
Self-reported proximity	.33***	-.63***	.21
Self-reported distance	-.26*	.47***	-.05
Relative proximity-distance	.22	-.63***	.09
IOS	.24**	-.74***	.20
Closeness towards the self	-.25**	.63***	-.26**

* $p < .10$; ** $p < .05$; *** $p < .01$

Relation between Individual Differences in Attachment and Self-Report Indices of Closeness-Distance

As shown in Table 6, both attachment anxiety and avoidance significantly predicted self-reported proximity seeking. As expected, individuals scoring higher on attachment anxiety reported more proximity seeking towards the attachment figure, whereas a negative relation was found with attachment avoidance. With regard to self-reported distance keeping, a significant main effect emerged of attachment avoidance and a marginally significant main effect of attachment anxiety. Again, individuals scoring higher on attachment avoidance reported a greater preference for interpersonal distance in their attachment relationship, whereas the more anxiously attached individuals tended to report less distance keeping. Similar to Experiment 1, the regression analysis on the relative proximity-distance measure revealed a significant main effect only of attachment avoidance, demonstrating avoidant individuals' preference for distance over proximity. Finally, the IOS-scale and the closeness-towards-

the-self measure were significantly related with both attachment anxiety and avoidance. As predicted, individuals with higher scores on attachment anxiety report more closeness towards their attachment figure, whereas individuals higher on attachment avoidance report less closeness and interconnectedness. Unlike to the previous experiments, the analyses on the closeness-towards-the-self measure also revealed a significant interaction effect of attachment anxiety and avoidance. In order to interpret this significant interaction, we plotted the regression lines for high (+1 *SD* above the mean) and low (-1 *SD* above the mean) values of attachment avoidance and anxiety. Significance tests for slopes indicated that only the regression lines for low anxiety ($\beta = .82$, p < .01) and low avoidance ($\beta = -.55$, p < .01) were significant (all other *p*'s > .10). This indicates that high attachment avoidance, only in combination with lower scores on attachment anxiety, is associated with more reported distance between the self and the attachment figure. Attachment anxiety, on the other hand, is related to more reported closeness towards the attachment figure, but only in combination with lower scores on attachment avoidance. These findings conform to theoretical descriptions of attachment anxiety and avoidance (see Mikulincer & Shaver, 2003).

Table 7

Relation between the IAT and the self-reported closeness-indices in Experiment 3

Self-reported closeness indices	IAT score
Self-reported proximity	.19
Self-reported distance	.13
Relative proximity-distance	.21
IOS	.27*
Closeness towards the self	-.18

* *p* < .10; ** *p* < .05

Relation between IAT and Self-Report Indices of Closeness-Distance

Contrary to the previous experiments, no significant relation was found between the IAT and the self-reported closeness-distance indices, except for a

marginally significant correlation with the IOS-scale (see Table 7). In relation to the latter, we found that the more positive one's implicit attitude towards proximity seeking, the stronger the interconnectedness one reports with the attachment figure.

DISCUSSION

In line with the results of Experiments 1 and 2, individuals scoring higher on attachment avoidance evaluated distance goals as more positive than proximity goals, and reported more (actual and preferred) distance in their attachment relationship. In the case of attachment anxiety, however, the present results did not reveal the expected positive implicit evaluation of proximity goals, although they did report preferring and experiencing higher levels of proximity towards the attachment figure. This replicates the pattern of results observed in Experiments 1 and 2. Unlike to what was the case in the previous two experiments, the IAT score was virtually unrelated to the self-report indices of closeness-distance. We will return to this finding in the General Discussion.

GENERAL DISCUSSION

The primary objective of the present research was to examine the assumption that attachment anxiety and avoidance are related to proximity and distance goals respectively. For this purpose, we used a variant of the IAT to measure one's implicit motivation for proximity and distance regarding the attachment figure, in combination with explicit measures of these goal-representations. With regard to attachment avoidance, all three experiments revealed a clear and consistent pattern of results. Specifically, it could be demonstrated that attachment avoidance was related to a stronger implicit motivation for and positive evaluation of distance goals (relative to proximity goals), which illustrates their tendency to downplay attachment motives and overemphasize the need for interpersonal distance (e.g., Mikulincer & Shaver, 2007). In general, these results are in line with theoretical ideas and empirical findings suggesting that avoidant individuals lack the motivation to seek proximity towards the attachment figure in an attempt to avoid intimacy, which may be further linked to their compulsive need for control, self-reliance, and self-protection (for a

review, see Mikulincer & Shaver, 2003, 2007; Shaver & Mikulincer, 2002). Importantly, the relation between attachment avoidance and distance goals was found both at the implicit and explicit level, and both in a stress and non-stress context. Although avoidant strategies are regularly believed to create dissociations between implicit and explicit responses, our results indicate that distance goals are both implicitly and explicitly represented in avoidant working models. This fits with the notion that implicit and explicit processes can operate in the same direction to achieve a goal and that implicit motives are often manifested in conscious appraisals and vice versa (Chartrand & Bargh, 2002).

The finding that distance goals were pursued irrespective of the presence of threat does, however, not fit well with theoretical predictions and empirical research showing that avoidant individuals' tendency to act in a distant manner is confined to stressful situations, because coping actions are required only in those situations (Mikulincer & Shaver, 2003; Simpson, Rholes, & Nelligan, 1992). The chronic activation of distance goals in avoidant individuals might be explained by referring to their social learning history. Given that attachment avoidance would result from repeated experiences of rejection in attachment relationship(s), it is likely that avoidant individuals have learned to suppress proximity needs and proximity-seeking efforts towards the attachment figure (e.g., Fraley, Davis, & Shaver, 1998). As a result, they are less sensitive to positive outcomes and place less value at attachment needs, because they are chronically concerned with maintaining their well-practiced defences, especially in an attachment-related context. Although our results strongly suggest that distance goals are chronically activated in avoidant individuals, more direct tests are needed to further examine this conclusion. Such tests may require randomly assigning avoidant subjects to different levels and sources of distress and measuring its effect on implicit proximity-distance goals.

It is also important to note that the findings of Experiment 2, in which motivational responses were measured in the context of distress, are at odds with other social-cognitive research demonstrating that a distressing context causes a breakdown in the avoidant defensive system, resulting in the automatic activation of proximity-related themes (Mikulincer et al., 2000). This divergence in results may, however, partially be explained by the methodological differences between our study and that of Mikulincer and colleagues. That is, the latter relied on another task (i.e., lexical decision task) for measuring proximity

and distance responses, and focused on the accessibility of cognitive constructs rather than measuring the dynamic and motivational component of goal-representations. Also, Mikulincer et al. used attachment-unrelated *word*-primes (e.g., death and illness) which are less self-relevant than our visualisation task and do not refer to a specific attachment-context. Furthermore, in the Mikulincer study, attachment style and proximity-distance were measured without any reference to a specific attachment relationship. This last point is crucial because it can be speculated that both proximity and distance needs are cognitively represented in avoidant working models, and that the activation of each of these representations will depend on specific contextual or relational features. In the present study, we measured proximity-distance goals within a specific attachment relationship and this context may have served as a retrieval cue for the activation of distance goals in avoidant individuals. This fits with research on automatic goal-activation showing that when a goal-representation is consistently and repeatedly activated in a given situation (i.e., attachment relationship), this goal will become chronically and automatically activated in this specific (relational) context (see Custers & Aerts, 2007; Higgins, 1996). Further research is needed to better understand the associative links between the different motivational components of attachment schemas, to identify which mechanisms underlie their activation or inhibition, and to examine whether these representations and processes differ across relationships.

Individuals scoring higher on attachment anxiety also showed an interesting and fairly consistent pattern of results. Across three experiments, attachment anxiety was related to proximity goals only when dependent variables were measured explicitly, but not when goal-activation was measured at the automatic level. That is, no relationship was found between attachment anxiety and the level of responding on the proximity-distance IAT, neither when measuring the implicit *motivation* for or implicit *evaluation* of proximity goals. As such, the present results were in line only with previous self-report findings and could thus provide only partial support for the theoretical assumption that anxious individuals organise their goals around their unfulfilled need for love and support and their compulsive desire to maintain close contact with the attachment figure (see Mikulincer & Shaver, 2003). Note, however, that even at the explicit level, attachment anxiety did not consistently relate to all closeness-distance indices. Furthermore, the correlations between attachment anxiety and

self-reported closeness-distance were much lower than in the case of attachment avoidance. Regarding the latter, some of the correlations approached .80, even though we used proximity-distance measures that showed less procedural overlap with the attachment questionnaire than other self-report measures do.

On the one hand, our findings on the IAT oppose other research on automatic goal-activation in which attachment anxiety was found to be associated with proximity goals (e.g., Gillath et al., 2006; Rom, & Mikulincer, 2003). On the other hand, the pattern of results on the IAT does converge with behavioural observation studies revealing that only variation in attachment avoidance is related to proximity seeking, whereas so far no clear support has been found for the assumption that anxious individuals display higher levels of proximity seeking (e.g., Collins & Feeney, 2000; Fraley & Shaver, 1998; Rholes, et al, 2002; Simpson, et al., 1992). Given that the chronic and compulsive pursuit of proximity needs would constitute one of the most salient characteristics of anxious individuals, it is intriguing that this goal was manifested only in their self-reports and not in their implicit responses. Taking into account other evidence showing inconsistent (i.e., negative or insignificant) relationships between attachment anxiety and proximity seeking (e.g., Fraley & Shaver, 1998; Vogel & Wei, 2005), the observed discrepancy between self-reports and reaction times on the IAT may point to the fragile nature of anxious individuals' desire for interpersonal closeness. Nevertheless, we should be careful in interpreting these results because other evidence did demonstrate an association between attachment anxiety and proximity seeking at the automatic level (e.g., Dewitte, De Houwer, Buysse, & Koster, in press; Gillath et al., 2006). Therefore, we also need to consider other possible explanations for the lack of association between the proximity-distance IAT and attachment anxiety.

One possible explanation could be the limited range of attachment anxiety scores in our samples. This might result from the fact that our participants were not pre-selected based on their attachment style. Consequently, our sample did probably not enclose extremely high anxious (and avoidant) persons. Note, however, that we did find the expected results with regard to attachment avoidance and post-hoc analyses revealed no differences in the range of anxiety and avoidance scores across experiments. Other explanations could be related to the relative nature of the IAT. It has been argued that past failures to obtain comfort and support from the attachment figure may interfere with anxious

individuals' motivation to seek proximity to this person. Intense wishes for security and proximity, coupled with doubts about support availability and worries about rejection and abandonment may lead to ambivalence towards proximity seeking and approach-avoidance conflicts (Simpson et al., 1992). Hence, it could be that both proximity and distance goals are activated simultaneously in anxious individuals and this conflictive information may explain the lack of relationship between the IAT and attachment anxiety. That is, the procedure of the IAT indirectly inclines people to make comparative judgments on proximity *relative* to distance. To the extent that the interpretation in terms of conflicting motives is accurate, the relative nature of the IAT may thus impose a constraint on its potential to capture the underlying proximity goals of anxious individuals. This is less likely for avoidant individuals who clearly view intimacy and closeness as anti-goal states. This explanation does, however, not alter the fact that we still consider the IAT as a suitable instrument for testing the original theoretical predictions on attachment-related goal pursuit, because anxious and avoidant individuals are assumed to take extreme positions on the proximity-distance continuum. Furthermore, the IAT did have the potential to reveal the expected relationship between attachment avoidance and distance responses and yielded consistent results in three consecutive experiments. This further supports the value and usefulness of the IAT for investigating implicit behavioural goals in the context of attachment.

A final remark on the pattern of results regarding attachment anxiety is related to the previous one and concerns the observation that in all three experiments the self-reported *relative* proximity-distance index was not or only marginally related to attachment anxiety, whereas it was strongly related to attachment avoidance. Interestingly, this fits the pattern of results on the IAT which is also a relative measure and related only to attachment avoidance. Again, this seems to suggest that it may be the relative nature of the IAT that is responsible for the lack of relationship with attachment anxiety. In relation to this, it is reasonable to assume that relative measures tapping the closeness-distance continuum are more likely to reflect distance rather than proximity. Support for this assumption could be found in the results of Experiments 1 and 2 in which IAT effects were related only to the self-reported distance measure, but not to the proximity measure. Based on this argument, it can thus be expected that attachment anxiety will relate to IAT effects that assess only the proximity

dimension. This possibility could be explored in future research by using, for example, a single-target IAT (ST-IAT; Karpinski & Steinman, 2006) to measure implicit motivation and attitudes towards proximity independent from distance. Note that the ST-IAT may also be useful to test the idea that anxious individuals hold ambivalent attitudes towards proximity (cfr. supra). By administering separate ST-IATs and comparing the strength of positive and negative associations with regard to proximity and distance (and with regard to non-ambivalent attitude objects as a control comparison), we could test whether proximity and distance evoke equally strong positive and negative associations in anxious individuals (see de Liver, vander Pligt, & Wigboldus, 2007). In any case, delineating the conditions under which attachment anxiety relates to proximity goals as well identifying the mechanisms underlying attachment-related goal-pursuit will be important to further clarify whether the lack of relationship between attachment anxiety and implicit proximity motives reflects something about attachment anxiety, or something about our IAT measure.

Despite the aforementioned concerns regarding the link between attachment anxiety and implicit motives, the present studies did provide valuable new information on attachment-style differences in proximity and distance goals because (1) we explored these goals both in a neutral and stress context and measured them both at the implicit and explicit level, (2) we used self-report measures of proximity and distance that showed less item-overlap with the attachment questionnaire, and (3) we were the first to use a motivational IAT for assessing automatic goal-activation as a function of attachment. In relation to the latter, our studies have at least three observations that promote subsequent use of the IAT in attachment research. First, the use of an IAT for assessing proximity and distance goals allowed us to overcome the problem of shared method factors. As such, we could provide independent evidence on the theoretical assumptions above and beyond the specific method used. Secondly, because the IAT is able to directly assess goal-related cognitions at a pre-attentive, automatic level, the present studies could reveal unique information on the implicit aspects of working models that might not be accessible through self-report. In this context, it is noteworthy that, in two experiments, the IAT and the explicit closeness-distance indices were significantly related, though the amount of common variance was limited to 20 %. This leaves enough room for both measures to explain each a unique part of the attachment construct, which points

to the importance of using both self-report and indirect measures when testing assumptions derived from attachment theory (see Shaver & Mikulincer, 2002). A final observation that is worth mentioning concerns the pattern of results on the IAT which shows great similarities with the findings of behavioural observation studies, namely a significant relation with attachment avoidance and no relation with attachment anxiety. Both seem to contradict the findings on self-reported proximity in anxious individuals. This may possibly indicate that the proximity-distance IAT is tapping the same underlying processes that determine actual behaviour. This is an interesting observation, especially because proximity-distance goals can be regarded as the proximal determinants of attachment behaviour. In order to test this hypothesis in future research, it would be useful to examine the predictive value of the IAT in a study that compiles the IAT, self-report measures, and actual behaviour into one design.

In addition to providing evidence on the pursuit of proximity-distance goals as a function of attachment style, the present studies also add to the general literature on the IAT. First, given that the personalized motivational IAT was meaningfully related to individual differences in attachment style, it can be concluded from the present studies that the IAT can provide a valid index for measuring (attachment-related) motivational constructs. This should encourage researchers to extend its use towards other purposes than measuring evaluative associations. Second, we found that the personalized motivational IAT was more strongly related to the self-reported closeness-distance indices than the traditional IAT. On the one hand, this endorses the argument of Olson and Fazio (2004) that the personalized IAT is a better predictor of attitudes and behavioural intentions, and therefore less contaminated by extra-personal associations than its traditional counterpart. On the other hand, the traditional IAT appeared equally good in predicting avoidant individuals' *personally* pursued goals of distance and independence, which suggests that the IAT is not simply reflecting culturally shared information or societal views on proximity and distance in close relationships.

In conclusion, the present series of studies confirmed that attachment styles play a critical role in the goals adopted by an individual to regulate proximity or distance within attachment relationships. In testing this assumption, the IAT appeared to be a useful tool for assessing implicit motivational constructs. Therefore, we argue that it is valuable to continue working with the IAT in

attachment research, because this task can easily be adapted for measuring a range of attachment themes and as such advance our understanding on the cognitive and affective components of attachment working models that operate at an automatic level.

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CHAPTER 6

ON THE ROLE OF THE IMPLICIT SELF-CONCEPT IN ADULT ATTACHMENT [1]

ABSTRACT

We report a study that was designed to investigate attachment-style differences in the implicit self-concept and to evaluate the psychometric properties of the Implicit Association Test (IAT) in the context of attachment research. Two variants of the IAT were used to assess implicit relational self-esteem and relational anxiety after stress induction. Results showed that both the relational self-esteem and relational anxiety IAT (1) were meaningfully related to individual differences in attachment style and (2) predicted cognitive and affective reactions to attachment-related distress in addition to and beyond self-report measures of attachment. These results provide evidence for the reliability and validity of the IAT as an index of the implicit attachment self-concept.

INTRODUCTION

Implicit measures of psychological constructs constitute one of the most important and exiting developments in recent research on psychological assessment. Implicit measures can be defined as the outcomes of measurement procedures that reflect the to-be-measured construct in an automatic manner (e.g., De Houwer & Moors, 2007). When the constructs of interest are aspects of personality, implicit measures thus attempt to capture the automatic impact that personality can have on behaviour. Research has shown that implicit measures of personality can be related in a meaningful manner to actual behaviour and often allow one to predict behavioural responses above and beyond what can be predicted on the basis of self-report measures (e.g., Asendorpf, Banse, & Mücke, 2002; Schnabel, Banse, & Asendorpf, 2006). In the present study, we explore the usefulness of implicit measures in the context of adult attachment. Given that automatic processes are assumed to play a crucial role in attachment behaviour, implicit measures could provide a particularly useful contribution to research on this topic. As such, adult attachment represents an ideal subject to further explore the value of implicit measures in the assessment of individual differences.

One of the most prominent ideas of Bowlby's (1969, 1982) attachment theory is that early attachment experiences are internalized into mental representations of the self and others that coordinate cognition, affect, and behaviour in close relationships. These representations are also called 'internal working models' (IWM) and are thought to be core features of personality and the foundation of individual differences in attachment styles. Such individual differences can be organized within a two-dimensional space anchored by the models of self and others which, in combination, yield four prototypic attachment styles: secure (positive self and positive other), preoccupied (negative self and positive other), dismissive (positive self and negative other), and fearful (negative self and negative other) (Griffin & Bartholomew, 1994). More recently, an emotional and behavioural regulation interpretation of the two underlying dimensions has been recommended, reframing individual differences in terms of anxiety and avoidance (Brennan, Clark, & Shaver, 1998). These dimensions map theoretically onto the models of self and others, respectively. Integrating both frameworks, attachment anxiety is assumed to be associated with negative

beliefs about the self and others, whereas attachment avoidance would be characterized by positive self-views and negative expectations about others.

Given the broader social-cognitive interest in the self-concept, the present study focused specifically on attachment-related differences in self-representations rather than other-representations. Evidence from self-report studies is largely consistent with theoretical assumptions that attachment security is related to more positive beliefs about the self, whereas attachment anxiety is associated with lower self-esteem. With regard to attachment avoidance, findings are less coherent, with the majority of studies reporting negative or non-significant relationships between avoidance and global self-esteem (for a review, see Mikulincer & Shaver, 2007). This absence of an association could be related to the fact that self-report measures can reveal only partial information about the attachment self-model because such measures are limited to the study of explicit, introspectively accessible representations of the self-concept. This is an important restriction given that many aspects of attachment working models are assumed to operate in an automatic mode (Mikulincer & Shaver, 2003), which calls for the use of more implicit measurement procedures in the context of attachment.

Since working models have been conceptualized as cognitive-affective schemas (Baldwin, 1992), attachment researchers have started to rely on social-cognitive reaction time methods for investigating the accessibility and organization of self-representations. For example, using a Stroop colour-naming task and a self-description task with positive and negative self-relevant and -irrelevant words, it has been demonstrated that secure individuals show access to both positive and negative self-relevant traits. Anxious individuals, on the other hand, had ready access to negative self-traits, whereas avoidant individuals had better access to positive self-traits (e.g. Mikulincer, 1995; 1998). In a related study, Mikulincer, Dolev, and Shaver (2004) showed that the induction of a cognitive load following the imagination of a painful relationship break-up heightened avoidant individuals' access to negative self-traits, as was indicated by longer colour-naming latencies on negative self-relevant words in the Stroop task. In the non-load condition, attachment avoidance was related to lower accessibility of negative self-traits and heightened accessibility of positive self-traits. These results suggest that avoidant individuals tend to inflate their self-image by suppressing negative self-attributes. Accordingly, their self-esteem

should probably not be regarded as authentically positive, but rather as unstable and defensive in nature.

In another interesting study focusing on implicit self- and other-beliefs in the context of attachment, Zayas and Shoda (2005) used an Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) for measuring automatic evaluative associations regarding the self and a significant other. Their study revealed that scores on a Partner IAT (using the categories *partner, not-partner* and *pleasant, unpleasant*) were related to explicit measures of adult attachment styles, whereas a Self IAT (using the categories *me, not-me* and *pleasant, unpleasant*) was not related to adult romantic attachment. The latter null finding is intriguing because, as outlined above, automatic evaluations of the self are assumed to be crucial determinants of individual differences in attachment. We therefore decided to conduct a study aimed at further exploring the role of the implicit self-concept in the context of adult attachment. Drawing on the original assumptions of attachment theory, we tried to optimize our chances of finding the hypothesized relations between attachment styles and IAT measures of the self-model by changing the experimental design used by Zayas and Shoda in three ways.

First, we changed the IAT to measure relational self-esteem rather than global self-esteem. This change follows naturally from the core idea in attachment theory that the model of self is construed and embedded in relational experiences with significant others. Whereas global self-esteem is contingent on different domains (e.g., academic, physical, social) and entails a general positive or negative evaluation of the self in relative isolation, the 'relational self' reflects the extent to which one values the self as worthy or unworthy of love in relation to a specific attachment figure. We therefore created a variant of the IAT including instructions, labels, and items that explicitly refer to a particular relational context. Furthermore, in line with Zayas & Shoda (2005), we assessed attachment style with respect to one specific attachment figure because the self-model is likely to differ as a function of the specific attachment relationship (see Pietromonaco & Barrett, 2000).

Secondly, the lack of association between the Self IAT and attachment style in the Zayas and Shoda study (2005) could be attributed to the fact that automatic self-evaluations were measured in a relatively neutral and stress-free context. This is potentially problematic because attachment theory clearly

emphasizes the role of working models in regulating proximity and felt security when confronted with distress (Collins, Guichard, Ford, & Feeney, 2004). This implies that a challenge to the attachment system is required to activate the self-concept and hence to observe the expected attachment-style differences in implicit beliefs and attitudes regarding the self. We therefore induced a distress context before administering the IAT, using a procedure in which participants were asked to imagine their attachment figure going abroad for a long period of time. In relation to this, research has shown that disruptions of proximity to the attachment figure (e.g., separation), whether real or imagined, are important sources of distress that trigger the operation of attachment processes (Feeney & Kirkpatrick, 1996; Fraley & Shaver, 1997).

Third, in order to obtain a full understanding of the attachment self-concept, it is important to go beyond the study of self-esteem, which is just one aspect of the self, and to explore other attributes that could be part of one's self-concept. This fits with the general definition of the self-concept by Greenwald et al. (2002), who define the self as a cognitive structure that contains all associations of the concept 'self' with attribute concepts that are characteristic of the individual (see also Asendorpf et al., 2002). Given the correspondence between the self-model and the anxiety dimension of attachment, another important aspect of the attachment self-concept could be the extent to which the self is associated with relational anxiety, that is, the fear of being abandoned and rejected by significant others. Therefore, we also included an Anxiety IAT, which was designed to capture the anxiety component of the relational self-concept.

Based on available theories and evidence (see Mikulincer & Shaver, 2007), we expected that higher scores on attachment anxiety, as measured by the *Experiences in Close Relationships scale-revised* (ECR-R; Fraley, Waller, & Brennan, 2000), would be related to a decrease in implicit relational self-esteem and an increase in relational anxiety, as measured by the IAT. For attachment avoidance, we expected the opposite, namely a higher level of implicit self-esteem and a lower level of relational anxiety. With regard to the four-group approach on attachment-style differences, as measured by the *Relationships Questionnaire* (RQ; Griffin & Bartholomew, 1994), we predicted that the attachment styles with a positive self-model (i.e., secure and dismissive) would be related to an increase in implicit self-esteem and a decrease in implicit

relational anxiety, whereas the attachment styles with a negative self-model (i.e., preoccupied and fearful) should show the opposite pattern of correlations. On the other hand, because avoidant individuals have been shown to defensively suppress negative self-traits and feelings of rejection and anxiety (Mikulincer et al., 2004), it can also be expected that higher scores on the ECR avoidance and the dismissing item of the RQ will be related to a more negative implicit self-concept as measured by the IAT.

Although we expect to find meaningful correlations between the scores on the IAT and self-report questionnaires, it could also be that these correlations will be low to moderate because both types of measures are believed to tap related, though different aspects of a specific construct (Hofmann, Gawronski, Gschwender, Le, & Schmitt, 2005). We therefore added other criteria to assess the validity of the measures. Most importantly, we registered the thoughts and feelings that participants reported spontaneously in response to the hypothetical separation scenario and related these to the questionnaire and IAT measures. Note that separation experiences are assumed to have important implications for one's self-concept in terms of feeling unworthy and rejected (Bowlby, 1973; see also Mikulincer et al., 2004). Hence, if we could demonstrate that the IAT measures are related to these thoughts and feelings over and above the traditional questionnaires, this would demonstrate not only the validity of the IAT measures but also their added value in attachment research.

METHOD

Participants

Sixty-one first year psychology students (42 women, 19 men) at Ghent University participated in return for extra course credit.

Materials and Procedure

Identification of Attachment Figure and Separation Prime

First, each participant's primary attachment figure was identified using the WHOTO scale which consists of six questions referring to the three critical

features of an attachment figure (proximity seeking and separation distress, safe haven, and secure base; Hazan & Zeifman, 1994). For each question, participants had to write the name of the person that best served each of these functions. The person that was listed most frequently was labelled as the primary attachment figure. In case of an exaequo, we chose as the attachment figure the person that satisfied the larger number of attachment-related functions (see Fraley, & Davis, 1997). Because our sample consisted of adolescents and young adults, the attachment figure was either a partner, a good friend, or a parent. Then, participants were asked to imagine this attachment figure going abroad for one to two years and write about thoughts and feelings related to such an event.

Self IAT and Anxiety IAT

Subsequently, the two IATs were administered in a counterbalanced order to control for task order effects. To minimize error variance, the order of the blocks within each IAT was kept constant for all participants (see Hofmann et al., 2005). In accordance with Greenwald et al. (1998), the IATs consisted of five blocks in which participants had to categorise words as quickly as possible into different categories by pressing a left (Q) or right (M) response-button. The items were presented equally often in a random order. In the first block of the Self IAT, participants discriminated target-items by pressing a right key for *me*-words and a left key for *not-me* words. Next, they sorted attribute-items into *relationally worthy* (right) and *relationally worthless* (left) categories. The third stage combined these attributes and targets so that *me* and *relationally worthy* (right) had to be discriminated from *not-me* and *relationally worthless* (left). In Block 4, the key assignment for *relationally worthy* and *relationally worthless* was reversed. Finally, the two test blocks were repeated with the reversed response assignment (*me - relationally worthless* versus *not-me - relationally worthy*). The single-task blocks included 24 trials, whereas the dual-task blocks consisted of two sub-blocks of 48 trials. The procedure for the Anxiety IAT was identical.

As labels for the Self IAT, we used the Dutch words for *me* (items: me, myself, I), *not-me* (items: others, they, them), *relationally worthy* (items: loved, liked, agreeable) and *relationally worthless* (items: inferior, rejected, disagreeable). The stimuli of the Anxiety IAT were identical to those of the Self IAT, except that the labels and words of the attribute categories were replaced by

relationally not-anxious (items: relaxed, certain, surrounded) and *relationally anxious* (items: abandoned, tense, uncertain). Special efforts were made to ensure a good understanding of the category labels. Therefore, the IAT was preceded by an instruction screen informing the participants that the items and labels referred to their primary attachment relationship.

Self-Report Questionnaires

Next, participants completed a Dutch translation of the ECR-R (Fraley et al., 2000; ECR-R-NL, Buysse & Dewitte, 2004) and the RQ self-report scales (Griffin & Bartholomew, 1994; RQ-NL, Declercq, Bogaerts, Lievrouw, & Van Poppel, 2003). The ECR-R consists of an Anxiety scale (18 items) tapping fear of abandonment and strong desires for interpersonal merger, and an Avoidance scale (18 items) assessing discomfort with closeness, dependence and intimate self-disclosure. The ECR-R has proven to be internally consistent and adequate in terms of construct validity (e.g., Fraley et al., 2000). In the current sample, Cronbach's alphas were high for the Anxiety (.89) as well as for the Avoidance subscale (.92).

The RQ consists of 4 descriptive paragraphs, each reflecting a different attachment style (secure, preoccupied, dismissive, and fearful). Based on the recommendations by Fraley and Waller (1998), continuous ratings of the four prototypes were used by asking the participants to rate each of the descriptions on a 7-point scale in terms of how well the paragraph describes how they feel in their relationship with their primary attachment figure.

Finally, the 11 statements of the Marlowe-Crowne Social Desirability Scale (Crowne, & Marlowe, 1964) were administered to control for social desirability response biases.

RESULTS

Preliminary Analyses

IAT analyses were conducted with the D600 scoring algorithm recommended by Greenwald, Nosek, and Banaji (2003). The Self IAT score was computed by subtracting the mean latencies of the initial combined tasks from the mean latencies of the reversed combined tasks, so that larger positive IAT scores

reflected higher implicit relational self-esteem. For reasons of clarity, the Anxiety IAT score was calculated in such as way that larger positive scores reflected higher implicit anxiety. In order to evaluate the internal consistency of the IATs, we divided each combined block into two sub-blocks of equal length (first half and second half) and then calculated difference scores for these two halves. The Spearman-Brown coefficients revealed a good split-half reliability for both the Self IAT (.80) and the Anxiety IAT (.72).[2] Furthermore, a significant positive correlation was found between the two IAT scores, $r = .26$, $p < .05$.

Coding of the Responses to the Separation Scenario

The participants' spontaneous responses to a hypothetical separation from the attachment figure were coded by a coder who was unaware of the attachment and IAT scores of the participants. Coding reliability was assessed by independent coding of the responses of 35 randomly selected participants by another coder. Based on a first reading of the scenario's, several categories of thoughts and feelings were delineated (e.g., feelings of anxiety, sadness, jealousy, proud, trust, thoughts about abandonment, infidelity, positive and negative consequences for the relationship,…) and the coders counted if and how many times these thoughts and feelings were reported by each participant. For statistical reasons and reasons of clarity, the different categories were aggregated into four main variables of interest: the number of reported negative feelings, positive feelings, negative thoughts, and positive thoughts. Inter-coder reliability was satisfactory for all judgements (Cronbach's alphas of .90 for negative feelings, .83 for positive feelings, .92 for negative thoughts, and .85 for positive thoughts).

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[2] Given that the primary aim of the present studies was to identify individual differences in the implicit self-concept, we did not counterbalance the order of response assignment in the IATs (see Gawronski, 2002; Hofmann et al., 2007). Therefore, the IAT-effects cannot be interpreted in absolute terms. Yet, for the interested reader, we do report that participants generally evaluated themselves as being more relationally worthy and less relationally anxious (Cohen's d of 1.16 for the Self IAT and .87 for the Anxiety IAT).

Correlations among the IATs and the Attachment Questionnaires

As presented in Table 1, the Self IAT was significantly related to preoccupied attachment, as measured by the RQ, and attachment anxiety, as measured by the ECR.[3] The Anxiety IAT was related only to preoccupied attachment, as measured by the RQ. This indicates that the more anxiously attached individuals had less positive implicit self-concepts. No significant relations were found with the other attachment scales.

Regressions

To examine the predictive validity of the IATs, we performed a series of regression analyses with reported positive and negative thoughts and feelings as criterion variables and the IAT and attachment scores as predictors.[3] The analyses with the ECR and the RQ were conducted separately and are presented in Table 2. In a first series of regressions, the ECR anxiety and avoidance scores and their interaction term were entered in Step 1, and the Self and Anxiety IAT in Step 2. The regression analysis on reported *negative feelings* revealed that the ECR attachment scores made a marginally significant contribution in Step 1, R^2 = .11, p < .10, whereas the Self and Anxiety IAT showed an independent contribution when entered in Step 2, ΔR^2 = .12, p < .05. Both avoidant attachment, as measured by the ECR, and the level of implicit relational self-esteem and anxiety, as measured by the IAT, predicted feeling less negative about the imagined separation. With regard to the prediction of *positive feelings*, it was found that the attachment scores made a significant contribution in Step 1, R^2 = .12, p = .05, but the Self and Anxiety IAT did not add significantly to this prediction, ΔR^2 = .01, p > .10.

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[3] Because the ECR defines attachment security in terms of low scores on anxiety and avoidance, we also conducted (separate) regression analyses on the Self and Anxiety IAT with attachment anxiety, avoidance, and their interaction term as predictors. The interaction term between attachment anxiety and avoidance was not significant, t < 1.

Table 1

Correlations among all measures

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. ECR anxiety		.08	-.34***	.17	.64***	-.11	-.28**	.07	-.00	.21	-.28**	-.08	-.03
2. ECR avoidance			-.50***	.41***	-.13	.53***	.07	-.19	-.33***	.00	-.23	-.08	.11
3. RQ secure				-.55***	-.15	-.33***	.21	-.08	-.14	-.30**	.17	-.08	-.36***
4. RQ fearful					-.09	.20	-.02	-.04	-.00	.14	.02	.10	.20
5. RQ preoccupied						-.15	-.29**	.26**	.20	.19	-.20	.12	-.05
6. RQ dismissive							-.17	.01	-.07	.09	-.18	.12	-.04
7. Self IAT								.26**	-.29**	-.30**	-.01	-.08	-.06
8. Anxiety IAT									-.34***	-.21	.05	-.10	.01
9. Neg feelings										.36	.08	.04	-.02
10. Neg thoughts											-.16	-.07	.14
11. Pos feelings												.11	.09
12. Pos thoughts													.11
13.Soc desirability													

* *p* < .10; ** *p* < .05; *** *p* < .01

Specifically, only a significant main effect of attachment anxiety emerged, indicating that the more anxiously attached individuals felt less positive about the imagined separation. The regression analysis on reported *negative thoughts* revealed no significant effects of the ECR attachment scores, $R^2 = .06$, $p > .10$. There was, however, a marginally significant increment in explained variance from Step 1 to Step 2, $\Delta R^2 = .08$, $p < .10$, indicating that the Self IAT tended to predict fewer negative thoughts about the imagined separation. The regression analysis on reported *positive thoughts* revealed no significant effects, ps > .10.

Next, the above reported regression analyses were repeated, entering as predictors the RQ secure, fearful, preoccupied, and dismissive scores in Step 1 and the Self and Anxiety IAT in Step 2. These analyses revealed a significant independent contribution of the IAT measures on reported *negative feelings, ΔR^2* $= .13$, $p < .05$. More specifically, it was found that the Anxiety IAT significantly predicted more negative feelings about the imagined separation. The RQ attachment scores did not reveal significant effects. The regression analyses on *positive feelings*, *positive thoughts,* and *negative thoughts* showed no significant relations, ps >.10.[4]

Social Desirability

In order to control for the influence of self-presentation tendencies on the relation between attachment style, the IATs, and cognitive and affective distress responses, we conducted the same regression analyses as reported above, but entered social desirability in Step 1, the attachment scores in Step 2, and the IATs in Step 3. Controlling for social desirability did not affect the pattern of results in any of the analyses.

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[4] We also explored whether the order of IAT administration (Self IAT – Anxiety IAT vs. Anxiety IAT – Self IAT) would moderate the relationship between the IAT, the attachment scores, and the criterion variables by entering task order and the interaction terms into the regression analyses. Neither the order main term nor the interaction terms were significant, Fs < 1, indicating that the pattern of results was not affected by task order effects.

Table 2

Regressions on cognitive and affective separation responses as a function of self-reported attachment style (ECR and RQ) and Self and Anxiety IAT

Predictors	Negative feelings		Negative thoughts		Positive feelings		Positive thoughts	
	β	*t*	*β*	*t*	*β*	*t*	*β*	*t*
ECR anxiety	-.06	-.49	.15	1.15	-.28	-2.16**	-.10	-.75
ECR avoidance	-.27	- 2.12**	.07	.51	-.22	-1.63	-.04	-.32
ECR anx X avoid	.01	.05	.10	.75	-.01	-.04	.15	1.09
Self IAT	-.22	-1.73*	-.24	-1.74*	-.10	-.70	-.12	-.81
Anxiety IAT	.24	-1.87*	.13	-.99	-.10	-.73	-.11	-.77
	β	*t*	*β*	*t*	*β*	*t*	*β*	*t*
RQ secure	-.14	-.86	-.23	-1.45	.16	.98	.06	.33
RQ fearful	-.04	-.28	-.02	-.09	.13	.81	.11	.70
RQ preoccupied	.02	.14	.10	.74	-.24	-.1.66	.18	1.24
RQ dismissive	-.14	-1.06	-.01	-.07	-.21	-1.52	.14	.96
Self IAT	-.21	-1.53	-.23	-1.66	-.15	-1.03	-.05	-.38
Anxiety IAT	.27	2.10**	.08	.58	-.01	-.05	-.15	-.11

* p < .10; ** p < .05; *** p < .01

DISCUSSION

The results of the present study showed that the levels of implicit relational self-esteem and implicit relational anxiety, as measured by the IAT, (1) were meaningfully related to individual differences in attachment style, as measured by the ECR and RQ, and (2) were able to predict attachment-related thoughts and feelings in addition to and beyond self-report measures of attachment. This supports the value of the IAT as a reliable and valid index of the implicit attachment self-concept.

Regarding the relation between individual differences in attachment style and automatic evaluations of the self, our findings showed that attachment anxiety,

as measured by the ECR and the RQ (i.e., preoccupied attachment), was associated with lower implicit relational self-esteem and higher implicit relational anxiety. This fits with the theoretical description of anxious individuals as feeling anxious, worthless, weak, and unloved, especially when dealing with (attachment-related) distress (Mikulincer & Shaver, 2003). Avoidant attachment, in contrast, showed no significant association with either the self-esteem or the anxiety component of the implicit self-concept. On the one hand, this fits with previous self-report studies revealing inconsistent (i.e., negative to non-significant) results regarding the relation between self-esteem and avoidant attachment (see Mikulincer & Shaver, 2007). On the other hand, studies using reaction time measures did show a positive self-view in avoidant individuals (Mikulincer, 1995, 1998) and even found that their self-view became negative when a cognitive load was added, which points to the instability of the avoidant self-concept (Mikulincer et al., 2004). However, the emphasis of these studies on global positive and negative evaluations of the self impairs an accurate comparison between previous and present results, because we specifically focused on the relational self within a particular attachment relationship. In this context, it is worth noting that avoidant individuals tend to dismiss relational sources of self-esteem, which may be further linked to their preference for self-reliance and interpersonal distance. As such, their self-view is likely to depend on the specific domain (e.g., achievement, social) in which it is assessed (see Carnelley, Israel, & Brennan, 2007; Mikulincer & Shaver, 2007). Furthermore, the Mikulincer studies have relied on the emotional Stroop task for measuring implicit self-representations and this task does not allow one to draw conclusions on implicit self-esteem as such, but rather focuses on the *accessibility* of self-relevant traits.

The fact that we used an attachment-related distress prime may also provide a possible explanation for the lack of relationship with attachment avoidance. Previous research has shown that an attachment-related threat such as separation strengthens anxious individuals' self-devaluation in an attempt to elicit compassion and proximity of the attachment figure. The self-view of avoidant individuals, on the other hand, was found to be unaffected by relationship threats because they defensively suppress attachment needs as a means to keep their independence and self-control. An ego-oriented threat such as failure, on the other hand, did elicit the expected positive self-view in avoidant individuals

(Mikulincer, 1998; Mikulincer & Shaver, 2003). Hence, future research should incorporate both attachment-related and -unrelated threat contexts to examine more accurately the effects of threat on implicit relational self-esteem and anxiety as a function of attachment. With regard to attachment security, it is rather intriguing that no relationship was found between the IAT measures and the secure item of the RQ, especially when considering that secure individuals have been found to display a stable positive self-view that is unaffected by the induction of threat (Mikulincer, 1998).

The present study was also concerned with establishing the psychometric qualities of the IAT for assessing the implicit self-concept in the context of attachment. As is usually the case with IAT measures, split-half reliability was good. In addition, the observed correlations between the IAT and self-report measures of attachment style can be regarded as evidence for the convergent validity of the IAT scores. The fact that the present study did find theoretically meaningful correlations whereas other studies (e.g., Zayas & Shoda, 2005) did not, could be related to the fact that we induced relational distress and used variants of the IAT that focused on relational self-esteem and relational anxiety, rather than global self-esteem. Also note that the Anxiety IAT was related to explicit reports of attachment anxiety as measured by two independent attachment questionnaires that differ considerably in terms of format, which further supports the idea that both measures are tapping a common underlying psychological construct.

Correlations between self-report and implicit measures are, however, a somewhat ambiguous indicator of the validity of implicit measures. On the one hand, it can be assumed that both types of measures converge in a theoretically meaningful manner because they are believed to tap related constructs. On the other hand, implicit measures are assumed to capture features of the construct that cannot be captured by self-report measures. Also, current views on adult attachment could be incorrect in their predictions about how implicit and self-report measures should be related. We therefore also examined whether the IAT measures allowed predicting spontaneous affective and cognitive reactions to an imagined relational threat over and above what could be predicted on the basis of self-report measures. With respect to the ECR, both IATs added incremental validity over self-reported attachment style in predicting negative feelings reported after the induction of a (hypothetical) threat to the attachment

relationship. Also when the RQ scores were entered into the analysis, the IAT measures, especially the Anxiety IAT, made a unique contribution to the prediction of negative feelings, whereas self-reported attachment style did not. In addition, the Self IAT was the only variable that could predict negative thoughts in response to an imagined separation.[5] More specifically, we found that lower implicit relational self-esteem was related to a higher number of reported negative thoughts and feelings, whereas higher implicit relational anxiety was associated with reporting more negative feelings. This fits with theoretical predictions.[6] The fact that the IAT measures had incremental predictive validity in relation to self-report measures of attachment supports the validity of these implicit measures. It also underlines the importance of supplementing traditional self-report questionnaires with indirect measures of self-evaluations that are able to capture the automatic cognitive-affective components of the self-concept.

With regard to the predictive value of self-reported attachment styles, we found that attachment anxiety, as measured by the ECR, was related only to the number of reported positive feelings. This finding was somewhat unexpected. Although it is theoretically possible for anxious individuals to report less trust, sympathy, respect, etc. when confronted with a hypothetical separation from the attachment figure, it is more likely to find a relation with reported negative feelings because anxious individuals would be highly sensitive to relationship threats and react to separation with great distress and despair (Mikulincer & Shaver, 2003). The negative relation between avoidant attachment and reported negative feelings, on the other hand, does seem fully in line with theory and research showing that avoidant individuals dismiss negative emotional states and inhibit feelings of rejection, separation, or loss (Fraley & Shaver, 1997; Mikulincer, et al, 2004).

Although our results clearly demonstrate the usefulness of the IAT for assessing the implicit attachment self-concept, there are still some limitations that need to be discussed. First, the predictive value of the IAT regarding distress

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[5] Note that when the IAT measures were entered separately into the regression analyses, both the Self and Anxiety significantly predicted the number of reported negative feelings at the .05 level and thus showed both incremental validity above and beyond the ECR and RQ scores.

[6] The Pearson correlations between the IATs and negative thoughts and feelings further support these conclusions (see Table 1).

responses was rather low. This could be attributed to the fact that participants were exposed to an imagined, and not a real, separation threat which is likely to produce less intense distress reactions. Also note that, unfortunately, no manipulation checks were performed to control for individual differences in the vividness and ease with which participants imagined the separation scenario and these differences could have interfered with the obtained results. A second limitation concerns the fact that we measured distress responses only at the explicit level. Given that implicit and explicit processes are likely to differ, especially in the case of attachment avoidance (see Mikulincer et al., 2004), future research should include both implicit and explicit responses to separation distress as a dependent variable. In addition, parallel explicit ratings of relational self-esteem and anxiety are lacking, which prevented us from providing a more comprehensive test of the incremental validity of the IAT in relation to self-report. Third, we did not include a control condition to compare the influence of threat versus no threat on attachment-style differences in the implicit relational self-concept. Hence, at this point, it is not entirely clear whether the differences between our results and those of Zayas and Shoda (2005) should be attributed to the use of a separation-threat prime, to our focus on the relational self instead of the global self, or both. Future research is needed to directly examine the influence of threat on self-representations by varying the level and source of distress before administering the IAT. Finally, not all distress responses were predicted as well by the IAT measures and/or attachment questionnaires. On the other hand, the fact that the Self and Anxiety IAT were related only to the negative, and not to the positive, thoughts and feelings could be interpreted as support for the validity of the IAT measures, because this fits with the idea that attachment working models serve distress-regulation functions and are thus primarily oriented towards coping with negative stimuli (Mikulincer & Shaver, 2003).

In summary, the present findings provide first evidence that IAT measures of relational self-esteem and relational anxiety have the psychometric properties of reliability and validity that justify their use in attachment research. Our results also suggest that it is crucial to create the right conditions, in terms of IAT items and situational context, to improve the validity of the IAT as a measure of attachment working models. In view of future attachment research, we think it is important to further investigate the role of the implicit self-concept by exploring

more complex and diverse self-representations in relation to different situational contexts and different attachment figures, and by encouraging further use of the IAT for assessing the cognitive and affective components of attachment working models that operate at a pre-attentive, automatic level.

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GENERAL DISCUSSION

A core assumption of attachment theory is that one's history of attachment experiences is stored in a set of mental representations that are automatically activated whenever attachment-relevant events occur. Once activated, these representations are expected to have a direct impact on cognitive processing, emotional appraisal, and behavioural responses. Although it is generally held that attachment behaviour is rooted in automatic processes, until recently, the automatic nature of attachment working models has remained largely unexplored and the precise processes through which they operate are not yet well understood. Fortunately, attachment researchers have recently started to integrate social-cognitive ideas into the study of attachment dynamics and started to rely on experimental paradigms for studying the implicit features of attachment system functioning that might not be accessible through self-report. In doing this, both theory and research have shifted towards exploring the *implicit (i.e., automatically activated) content* of working models and have put more emphasis on the role of several *processes* that are involved in the activation and regulation of the attachment system (see Shaver & Mikulincer, 2002; Mikulincer & Shaver, 2003). However, current evidence on the automatic aspects of attachment is still limited in important ways and many assumptions have not yet been tested. The aim of the present research project was to extend and contribute to the growing literature on automaticity in the context of attachment. Using various indirect measurement procedures, we explored whether and in what way context and attachment style are related to implicit representations and cognitive and behavioural processes. Hypotheses were most explicitly developed for attachment anxiety and avoidance because both dimensions are assumed to be associated with cognitive distortions and motivational tendencies that operate in opposite ways.[1] According to attachment theory, the regulatory strategies underlying attachment anxiety and avoidance would be most distinct in the

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[1] Note that the terms 'attachment anxiety' and 'attachment avoidance' (as well as anxiously and avoidantly attached individuals) could be incorrectly interpreted as reflecting distinct categories instead of two continuous dimensions. Therefore, it would be more correct to use the labels "individuals scoring higher on attachment anxiety/avoidance" because this better conveys the dimensional and continuous aspect of attachment styles. However, we decided to use the original labels for reasons of brevity and clarity.

processing of incoming emotional information and in the regulation of proximity seeking when feeling insecure and threatened (Mikulincer & Shaver, 2003, 2007).

In the first part of this dissertation, we presented a series of studies on a neglected component of attachment functioning, namely *attention*. This cognitive process is nevertheless of crucial importance in the activation and regulation of the attachment system, because it is involved in the appraisal and monitoring of environmental changes and attachment figure availability (in function of detecting potential threat). In addition, we explored the process of *proximity seeking*, both at the cognitive and behavioural level, as a central mechanism for regulating distress. The second part of the project presented a series of studies on two important components of attachment working models, namely *proximity and distance goals* as a central regulator and motivator of cognitions and behaviour, and *self-representations* as an integral part of appraisal processes and behavioural responses.

We begin this general discussion with a summary of our main results and elaborate on the most relevant findings. Next, theoretical implications of our results will be discussed in relation to some broader considerations regarding the current view on attachment. Throughout this discussion, we will also provide a number of recommendations and guidelines for future research. Finally, we indicate several limitations of our studies.

SUMMARY OF THE MAIN RESULTS

STUDIES ON ATTACHMENT PROCESSES

Attention to Emotional Attachment-Related Information

Although attachment theory suggests that insecure attachment orientations are characterized and maintained in part by attentional biases that shape emotional response patterns (e.g., Bowlby, 1980; Main, 1990), little research has been directed at investigating the relation between attachment style and attentional processing of incoming information that is emotionally significant and potentially relevant to attachment concerns. According to the theory, the extreme negative emotional responses associated with attachment anxiety would

result from hypervigilance to negative emotional input. Avoidant individuals, on the other hand, are expected to divert attention away from information that could potentially activate the attachment system. No research to date has provided a clear test of these theoretical assumptions. The research reported in Chapters 1 and 2 therefore aimed at exploring attachment-style differences in the allocation of attention to negative and positive emotional information. In **Chapter 1**, we used a dot-probe task presenting general and attachment-related positive and negative words. The results showed that attachment anxiety and avoidance yield similar response patterns in attentional processing, namely attentional avoidance of attachment threat. This attentional avoidance effect was best predicted by the interaction between high scores on attachment anxiety and avoidance, and not by their unique main effects. Furthermore, only attention for attachment-related threat words was significantly related to individual differences in attachment style. No relationship was found with attention for general threat or positive words. The observed interaction effect is compatible with the 'fearful' pattern of attachment that is commonly described in terms of cognitively closure and avoidance of negative attachment information (Bartholomew, 1990). It is, however, remarkable that no support was found for the expected vigilance-effect in anxious individuals. Because the latter is an important prediction of attachment theory, the study reported in **Chapter 2** was designed to further explore the attentional patterns associated with individual differences in attachment style by presenting pictures of happy, angry, and neutral faces in an exogenous cueing task. Facial expressions would have a higher degree of social relevance than words and may signal interpersonal acceptance and rejection. Such signals would be highly salient for anxious individuals who are characterized by a strong need for approval and a rejection-oriented focus. On the one hand, we expected to replicate our previous findings. On the other hand, it could also be that angry faces are more potent cues for eliciting the expected vigilance in anxious individuals. Interestingly, a similar pattern of results emerged as in the study of Chapter 1 and this attests to the reliability of our findings regarding the attentional styles associated with attachment anxiety and avoidance. More specifically, the results of the second study showed that the interaction between high-attachment anxiety and high-attachment avoidance was associated with reduced attention for relationally threatening stimuli. Once more, this pattern of results can be linked to the cognitive-processing mechanisms

associated with fearful attachment. Our results are also in line with findings in the general attentional bias literature, showing that individual differences in attentional orienting are an interactive function of both the level of anxiety and defensiveness (Eysenck, 1997; Ioannou, Mogg, & Bradley, 2004). One way to explain the avoidant attentional style associated with insecure attachment is that such a pattern could possibly assist in mood regulation by reducing anxious mood states in a self-regulatory way. Although we did not make specific predictions regarding attention allocation to positive stimuli, the results of Chapter 2 revealed that the interaction between attachment anxiety and avoidance also predicted reduced attention for positive stimuli, specifically happy faces. The fact that this avoidance-effect emerged only when attachment avoidance, rather than attachment anxiety, was considered as the moderator variable, supports an explanation in terms of the defensive nature of deactivating strategies that would limit attention to any emotional material that makes salient attachment needs (e.g., Edelstein, 2006). In addition, the second study also, unexpectedly, revealed that attachment anxiety was significantly (or marginally significantly) related to attentional avoidance of happy and angry faces, whereas attachment avoidance yielded no significant main effects. Based on theoretical predictions, we would have expected the opposite. We will elaborate on these findings later in this general discussion.

Attention to Attachment Figure-Related Cues

Whereas the studies presented in Chapters 1 and 2 focused on selective attention in the service of processing incoming emotional information, **Chapter 3** aimed at investigating attention as a regulatory mechanism for optimizing proximity goals, once the attachment system has been activated by emotional cues. According to attachment theory, the activation of the attachment system is not necessarily manifested in actual proximity seeking, but can also trigger the cognitive system by activating proximity-related cognitions or mental representations of the attachment figure (see Mikulincer, Birnbaum, Woddis, & Nachmias, 2000; Mikulincer, Gillath, & Shaver, 2002). Such mental representations are likely to direct attentional resources towards attachment figure-related cues.

In four experiments, we investigated both the normative and individual-differences component of selective attention to attachment figure-related cues, using a dot-probe task in which the name of the attachment figure, the own name, and the name of an acquaintance were presented in combination with a neutral name. Our results showed that priming with an attachment-relevant context (i.e., separation from the attachment figure) automatically activated an attentional bias towards the attachment name. This bias was consistently associated with attachment anxiety, but not with attachment avoidance. In addition, the relation between attachment style and attention was found to be specific to the attachment name and not driven by familiarity or salience effects. Contrary to the prediction that the activation of the attachment system, and thus proximity goals, is dependent on the experience of distress, we found that the induction of both a threat and positive attachment context caused people to increase attention to attachment figure-related cues. In explaining this result, it is important to consider that proximity towards the attachment figure may not be driven solely by the attachment functions this person serves. That is, people do not always turn to their attachment figure to alleviate distress in times of need, but also seek proximity to engage in affiliative, sexual, and exploratory activities. Such affiliative goals may have been activated when imagining an enjoying day out with the attachment figure. The fact that, after the induction of a positive prime context, a significant relationship was found between attachment anxiety and vigilance to attachment cues may thus suggest that anxious individuals are overly sensitive to pursuing affiliation-related goals. On the other hand, because vigilance to the attachment figure emerged in both threat and positive contexts, this result may also be interpreted in terms of their chronically active attachment system that would be characterized by chronic and vigilant monitoring of the attachment figure in function of gaining proximity and security. In support of this, research on attachment and affiliation in adolescent relationships has revealed that anxious individuals are almost exclusively focused on pursuing attachment-related goals, regardless of context (Mikulincer & Selinger, 2001). Their chronic focus on gaining security may arise from difficulties in inhibiting rejection-related thoughts, which may cause anxious individuals to interpret positive affect in negative terms (e.g., Baldwin & Kay, 2003).

Unexpectedly, attachment avoidance did not relate to selective attention for attachment figure-related information. Hence, no evidence was found for the presumed attentional avoidance of attachment cues associated with attachment avoidance. This lack of relationship may in part be explained by the fact that threat was induced by a procedure in which participants were asked to consciously reflect on a relational threat situation. Given that avoidant individuals are found to defensively suppress separation-related thoughts to prevent unwanted activation of the attachment system (e.g., Fraley & Shaver, 1997; Fraley, Garner, & Shaver, 2000), it is likely that the use of this specific prime interfered with the cognitive processing of attachment figure-related information in avoidant individuals. In this vein, the lack of association between attachment avoidance and attention to attachment-figure cues may be understood as a kind of attentional even-handedness, resulting from the fact that separation threat is less subjective meaningful and thus less threatening to them. A similar explanation may be given for the fact that no relationship was found between attachment avoidance and attention to attachment cues after a positive prime-induction. In relation to this, it has been argued that avoidant individuals dismiss any kind of emotional experience that could potentially activate the attachment system or promote interpersonal closeness (Cassidy, 1994). Note that the use of a conscious prime may also explain the divergence in results between our study and that of Mikulincer and colleagues (2002) in which the subliminal priming of a separation threat word slowed down avoidant individuals' access to their attachment figure's name in a lexical decision task. The use of a subliminal word-prime may allow circumventing defensive suppression of distress in avoidant individuals and preconciously activate a defensive and inhibitory response towards attachment figure-related information. Another important difference between our study and that of Mikulincer et al. is that they focused on cognitive accessibility of *mental representations*, whereas we focused on the *process* of attention allocation.

Taking together the results on attention allocation in the context of attachment, it can be concluded that selective attention for emotional and attachment figure-related cues did vary as a function of attachment style. This is consistent with the attachment literature suggesting that individuals manage their close-relationship affect and behaviour in part through selective attention (e.g., Main, Kaplan, & Cassidy, 1985).

Approach-Avoidance Action Tendencies

In addition to investigating the regulation of closeness at the cognitive level, **Chapter 4** aimed at investigating proximity seeking as an automatic action tendency that is associated with achieving attachment-related goals. Although considerable empirical attention has been devoted to the study of proximity seeking as a central regulatory mechanism in the attachment behavioural system, our studies constitute one of the first systematic attempts to directly examine both the automatic and behavioural component of proximity seeking. As such, we could provide a more direct test of proximity seeking as an automatic goal-directed response associated with approach-avoidance tendencies.

To investigate approach-avoidance tendencies that are automatically evoked by attachment figure-related stimuli, we used a stimulus response compatibility (SRC) task in which participants had to make symbolic approach and avoidance movements towards or away from attachment figure- and acquaintance-related words. In two experiments, we investigated both the normative and individual differences-component of proximity seeking by inducing a threat and neutral context before administering the approach-avoidance SRC task and exploring its interaction with attachment style. Our results showed that the induction of an attachment-related (i.e., separation) and attachment-unrelated (i.e., academic failure) threat context automatically increased behavioural responses oriented towards the attachment figure (relative to an acquaintance), compared to the induction of a non-threat context. In both experiments, attachment anxiety was associated with faster approach (versus avoidance) responses towards the attachment figure (relative to an acquaintance) and this relation was not influenced by the type of prime condition (i.e., separation, failure, and neutral). This again suggests that the attachment system of anxious individuals is chronically activated. Attachment avoidance, in contrast, was related to a weaker tendency to approach the attachment figure. The latter could, however, only be demonstrated in Experiment 2 in which an ego-oriented, attachment-irrelevant threat context was induced, but not in Experiment 1 in which a separation threat was primed. At first glance, this pattern of results could be explained by the fact that a failure prime is more salient to elicit distress in avoidant individuals (compared to a separation prime, cfr. supra). Such distress is likely to activate their self-regulatory strategies of keeping independence and avoiding closeness (e.g., Mikulincer, 1998). The nature of the threat prime can, however, not fully

explain the observed pattern of results, because the association between attachment avoidance and the approach-avoidance index was found to be independent from the presence of threat. Although we have to be cautious in interpreting the lack of interaction effects between attachment anxiety, avoidance, and prime condition (because of the small sample sizes), the present results do suggest, to some extent, that both context and attachment style independently influence behavioural responses.

Interestingly, to our knowledge, this study provides first evidence that attachment anxiety does relate to behavioural strategies oriented towards approaching the attachment figure. Previous observational research could not demonstrate such a relationship (e.g., Fraley & Shaver, 1998; Simpson, Rholes, & Nelligan, 1992). Because overt behaviour is subject to both controlled and automatic determinants, other regulatory processes and competing goals may detract anxious individuals from seeking actual proximity and eventually impair the translation of automatic action tendencies into overt behaviour. This indicates that in order to gain a clearer understanding of the behavioural responses associated with different attachment styles, it is most important to focus not only on behaviour, but also on its proximal determinants, namely goals and automatic action tendencies (also see Carver & Scheier, 1998).

STUDIES ON ATTACHMENT REPRESENTATIONS

Proximity and Distance Goals

To gain deeper insight into the motives that drive attachment processes, **Chapter 5** aimed at investigating proximity- and distance-related goal-representations that are stored in attachment working models. Although attachment theory delineates a number of goal-states, our research focused specifically on proximity and distance (independence), because these sub-goals are assumed to be most influential in directing cognition and behaviour in the service of obtaining felt security. Proximity and distance goals may lead individuals to interpret and respond to similar situations in very different ways. Furthermore, the pursuit of proximity and distance goals is assumed to be one of the most crucial differences between anxious and avoidant attachment, because what is regarded as a goal for the one attachment dimension would be an anti-

goal for the other dimension. There is, however, little empirical work that directly assesses attachment goals, especially at the automatic level.

In three experiments, we used a variant of the Implicit Association Test (IAT) to measure attachment-style differences in the implicit motivation for and evaluation of proximity and distance. In addition, we also registered explicit reports of these goal-representations. Across experiments, we found that attachment avoidance was associated with a stronger implicit motivation for and a positive evaluation of distance goals (relative to proximity goals), both at the implicit and explicit level and both in a stress and non-stress context. This indicates that avoidant individuals tend to overemphasize their need for social distance at the expense of establishing proximity and intimacy, probably in the service of maintaining autonomy and independence. Furthermore, our results suggested that distance goals are chronically activated in avoidant individuals, irrespective of the presence of threat. In relation to this, it can be speculated that the compulsive and automatic pursuit of avoidance goals serves to reduce their fear of intimacy and maintain their habitual defences, which may be further linked to self-protection goals (Pietromonaco & Barrett, 2000). This behavioural rigidity and fixation on one interpersonal goal is likely to result in poor relational outcomes. Also note that, although avoidant strategies are regularly believed to create dissociations between implicit and explicit responses, we found that avoidant individuals' preference for interpersonal distance does not necessarily involve conscious deliberation, but may be well understood as an automatized self-defensive response that is able to override a primary goal of the attachment system, namely proximity maintenance towards the attachment figure. The observed relation between attachment avoidance and distance goals fits, to some extent, with the approach-avoidance study, presented in Chapter 4, in which attachment avoidance was found to facilitate avoidance-oriented motivational processes independent from the presence of threat. Results were, however, not completely comparable across studies because the induction of a separation threat evoked distance-related responses in the IAT-study, but not in the approach-avoidance study. The focus on processes versus representations may provide a possible explanation for this divergence in results. That is, several other competing goals and regulatory processes may cause that goals do not necessarily reach behavioural intention (see Bargh, Barndollar, Gollwitzer, Trötsel, 2001).

With regard to attachment anxiety, the expected relationship with proximity goals was observed only when dependent variables were measured explicitly, but not when goal-activation was measured implicitly using the IAT. Remarkably, even the induction of a separation threat, which was assumed to make proximity-related concerns more salient in anxious individuals, was not sufficient to evoke a significant association between attachment anxiety and automatic proximity goals. This would have been expected based on attachment theory and other empirical evidence on automatic goal-pursuit (e.g., Gillath, Mikulincer, Fitzsimons, Shaver, Schachner, & Barg, 2006; Rom & Mikulincer, 2003). Note that, at the explicit level, anxious individuals did report preferring and experiencing lower levels of interpersonal distance and higher levels of proximity towards the attachment figure. The lack of relationship between attachment anxiety and proximity goals assessed at the implicit level is intriguing because the chronic and compulsive pursuit of proximity is generally conceived as a defining characteristic of anxious' hyperactivating strategies, which are likely to operate automatically. In Chapter 5, we therefore devoted considerable attention to providing possible explanations for this lack of association. Among these, an explanation in terms of the relative nature of the IAT that (1) is more likely to reflect distance rather than proximity or (2) may interfere with anxious individuals' ambivalent attitude towards proximity seeking (cfr. infra), might be regarded as most plausible. Note however, that these explanations cannot account for the observed relationship between attachment anxiety and responses on the SRC task (Chapter 4) which also evokes approach *relative to* avoidance responses.

Implicit Self-Representations

In exploring the implicit content of working models, we did not only focus on goal-related representations, but also aimed at investigating another important feature of attachment working models, namely self-representations. The beliefs that people hold about themselves and others are of great theoretical importance because they are assumed to serve or hinder the pursuit and attainment of attachment goals, and as such determine in part one's cognitive, affective, and behavioural responses in attachment-relevant contexts (e.g., Pietromonaco & Barrett, 2000). Although considerable empirical attention has been devoted to

the study of self-representations as a function of attachment style, the majority of this research can provide only limited information about the content of self-models. We therefore designed a study, reported in **Chapter 6**, in which several important adjustments were made to previous studies on the attachment self-concept. Most importantly, (1) we focused on beliefs about the relational self and relational anxiety within a given attachment relationship (instead of global positive and negative feelings), (2) we induced a challenge to the attachment system by priming a separation-threat context, and (3) we measured the self-concept at the implicit level. The latter point is crucial because beliefs about one's own lovability and anxiety in relation to the attachment figure are likely to be distorted by self-protective motives (e.g., Hinckly & Andersen, 1996). Furthermore, it has been argued that these beliefs have become solidified through repeated experiences and increasingly automatized over time (see Collins, Guichard, Ford, & Feeney, 2004), which calls for the use of measures that do not rely on conscious self-report.

Two variants of the IAT were used to assess implicit relational self-esteem and relational anxiety after the induction of a separation threat. Our results showed that attachment anxiety was related to lower implicit self-esteem and higher implicit anxiety. No relationship was found with attachment avoidance. In addition, we demonstrated that the IAT can provide a reliable and valid index of the implicit attachment self-concept. Our results are generally in line with other studies showing that the attachment anxiety dimension is most influential in modulating self-related responses (for a review, see Mikulincer & Shaver, 2007). Several theorists have argued that this negative self-view is a core vulnerability factor underlying attachment anxiety (e.g., Collins & Allard, 2001; Mikulincer, 1998; Pietromonaco & Barrett, 1997). Because anxious individuals might take some of the blame for relational failures, interpersonal rejection, and attachment figure unavailability, their negative self-view is likely to encourage hyperactivating responses. The resulting heightened experiences of distress and overdependence on the attachment figure may, in turn, further damage the anxious self-concept by emphasizing their helplessness, neediness, and vulnerability to rejection and abandonment. Interestingly, our results provide first evidence that anxious individuals' negative self-evaluation can be activated automatically and should thus not be regarded solely as a deliberate and conscious self-presentation strategy intended to capture the attention and support

of the attachment figure (Cassidy, 1994). This does, however, not imply that their negative self-view cannot serve this goal at the automatic level as well.

Contrary to the theoretical prediction that attachment avoidance is associated with a positive self-concept, researchers have suggested that avoidant individuals hold a fragile, defensive, and unstable sense of self-worth that may be negative in nature (Mikulincer, 1998; Mikulincer, Dolev, & Shaver, 2004). Accordingly, it was not clear whether to expect a higher or lower level of implicit relational self-esteem and anxiety in avoidant individuals. Unfortunately, our results could not provide conclusive evidence on this matter because avoidant attachment showed no significant association with either the self-esteem or the anxiety component of the implicit self-concept. The use of a separation threat prime (cfr. supra), in combination with our focus on the *relational* self-concept, may explain, to some extent, why we did find an association with attachment anxiety, but not with attachment avoidance. Unlike anxious individuals' broad and undifferentiated negative self-view, the self-view of avoidant individuals would depend on the specific domain in which it is assessed. In relation to this, it has been argued that especially anxious individuals value relational sources of self-esteem, whereas avoidant individuals derive their self-esteem from competence-based sources and tend to dismiss the importance of the relational self (Pietromonaco & Barrett, 2006; Carnelley, Israel, & Brennan, 2007). In addition, avoidant individuals are assumed to exclude feelings of anxiety and rejection from their self-view (Mikulincer et al., 2004), which may explain the lack of association between attachment avoidance and the score on both the relational self and anxiety IAT. Further research is needed to investigate whether the defensive strategies of avoidant individuals do indeed block access to a part of their self-concept that has arisen from past attachment experiences.

In this context, it is worth noting that the findings on the link between attachment anxiety and self-esteem are robust across studies, domains, and methodology, whereas most of the evidence on self-evaluations in avoidant individuals is rather inconsistent, especially when measured at the explicit level. In some studies, avoidant attachment is associated with higher self-esteem (e.g., Bartholomew, & Horowitz, 1991; Brennan & Morris, 1997), whereas other studies demonstrate a negative or non-significant relationship (e.g., Gentzler &

Kerns, 2004; Schmitt & Allik, 2005).[2] When measured at the automatic level, some studies have shown heightened accessibility of positive traits (Mikulincer, 1995; 1998); other studies provided evidence for defensive suppression of negative traits (after the induction of a cognitive load) (Mikulincer et al., 2004). Based on these findings, it has been argued that the self-view of avoidant individuals would differ at different levels of responding. This may suggest that research on the avoidant self-concept could benefit from studies that focus on the way their self-knowledge is organized and how it is influenced by regulatory processes, rather than identifying the valence associated with their self-representations. This would allow us to better understand under which conditions, in which domains, and at which measurement levels, avoidant attachment is associated with positive or negative self-beliefs. We will return to this later in the general discussion.

THEORETICAL IMPLICATIONS AND BROADER CONSIDERATIONS

The main objective of this research project was to directly examine several automatic processes and automatically activated representations underlying individual differences in adult attachment. In this part, we will discuss some of the challenges and problems that arise when studying individual differences in attachment system dynamics in order to arrive at a better understanding of our findings, to identify several shortcomings, and to offer a perspective for future research.

The Attachment System as a Dynamic Affect-Regulation System

The attachment behavioural system is by definition an emotion regulation device. Perceived threats automatically activate the system, which causes individuals to seek proximity to protective others (or to evoke a mental representation of them) as a means to manage distress and restore emotional balance. Individual differences exist in how the attachment system is likely to function and each of these different regulatory styles are assumed to have

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[2] In several studies of this research project, we included a measure of global self-esteem and did also consistently demonstrate a negative relationship with attachment anxiety and a negative or non-significant relationship with attachment avoidance.

specific effects on the processes that influence the generation, experience, and expression of emotions in thoughts, feelings, action tendencies, and behaviour. Accordingly, the attachment system includes multiple processes that are designed to increase, maintain, or decrease one or more components of an emotional response. In studying the relation between attachment style and these different regulatory processes, several difficulties can be encountered, resulting from the fact that emotion regulation is inherently dynamic in nature (e.g., Scherer, 2000). These emotional dynamics can arise from many different sources and can be manifested in many different ways, which introduces a great deal of complexity in theory and research on the attachment system, especially when making theoretical predictions on individual differences.

A first source of complexity results from the fact that emotion regulation includes multi-componential processes that unfold over time. That is, strategies differ in *when* they have their primary impact on emotion generation and regulation. Furthermore, strategies that act at different points in the emotion-process have importantly different affective, cognitive, and social consequences (Gross, 1998, 1999, 2002). In relation to this, it can be argued that emotion regulation is not a linear process. Positive and negative feedback loops create emotional circuits that allow for continuous change of the state of the system (Freeman, 2000). Secondly, the strategies that we rely on to increase, maintain, or decrease emotional experiences can operate in different ways at different levels of responding (i.e., automatic versus controlled). Third, the processes that are involved in emotion regulation are malleable. This implies that regulatory strategies are not inherently functional or dysfunctional; their efficiency depends in part on the particular situational context. Finally, the regulation of emotions is determined by one's currently active goals (Bargh, 1984; Frijda, 1986). Goals coexist in a hierarchy, with higher-level goals determining lower-level goals and lower-level goals contributing to the attainment of higher-level goals (Carver & Scheier, 1998). The complexity here resides in the fact that higher- and lower-level goals can exert their influence at different points in the regulation process. As such, a certain strategy can serve one goal at a given moment in emotion regulation and can be driven by another goal at another moment. In addition, higher- and lower-level goals can be in conflict. As a result, one goal can block the manifestation of another goal. Furthermore, when regulatory efforts fail in inhibiting competing goals, both goals and anti-goals can be activated

simultaneously, which impairs effective emotion regulation. Another complexity in the interplay between goals and emotion regulation is that there is no one-to-one relation between goals and regulatory strategies. That is, different strategies can serve the same goal and the same strategy can operate in the service of different goals. This makes it difficult to reliably identify the goals that modify or regulate subsequent processes.

Although current formulations of attachment theory do acknowledge the dynamic nature of the attachment system (Mikulincer & Shaver, 2003; Shaver & Mikulincer, 2002), they still hold on to a rather static view when making predictions on attachment-style differences in affect regulation. This is particularly the case for attachment anxiety and avoidance, which are assumed to be associated with distinct regulatory strategies that yield quite opposite effects on emotion regulation. That is, the hyperactivating strategies underlying attachment anxiety would *increase* the experience and expression of negative emotions and proximity seeking, whereas the deactivating strategies underlying attachment avoidance would *decrease* emotional and proximity-related responses. The results of our studies - and several other studies (e.g., Maier, 2005; Niedenthal, Brauer, Robin, & Innes-Ker, 2002) - did, however, reveal that differences among the insecure attachment dimensions were less clear than would have been expected based on attachment theory. This suggests that measuring at the automatic level attenuates many of the differences that emerge when respondents are asked to provide global and explicit reports of their thoughts, feelings, and behaviour. Understanding the attachment system as a dynamical system may allow us to put these results into another perspective. That is, according to such a dynamical view, differences and similarities may occur among anxious and avoidant individuals at different points in the regulation process. Hence, when studying (individual differences in) attachment dynamics, theory and research should take into account the timeline of emotion regulation, the distinction between automatic and controlled processes, the influence of context, and the interplay between regulatory processes and attachment-related goals. This clearly complicates theoretical predictions and the interpretation of our results. That is, to the extent that attachment anxiety and avoidance yield similar (different) effects on outcome measures, we cannot simply assume that these effects are driven by the same (different) processes and goals. In the following paragraphs, we will elaborate on the complexity of

attachment dynamics and illustrate some of the points mentioned above by relying on our data where possible.

The Dynamics of Attention

The complexity of affect regulation dynamics is probably most apparent in research on selective attention for emotional information. That is, when making predictions on attachment-style differences in attention allocation, we must take into account the time-course of attentional processing and its relation with attaining attachment-goals, at different levels of one's goal-hierarchy. Recall that the results of Chapters 1 and 2 could not provide support for the important theoretical prediction that attachment anxiety is associated with vigilance to negative emotional information. On the contrary, both insecure attachment dimensions were associated with avoidance-oriented responses and even functioned together in predicting reduced attention for attachment-related threat. Importantly, this attentional effect could not be ascribed solely to the moderating influence of attachment avoidance, because attachment anxiety was also found to moderate the relation between avoidant attachment and attentional avoidance (Chapters 1 and 2) and even independently predicted reduced attention for angry (and happy) faces (Chapter 2). This is at first sight difficult to account for in terms of attachment theory or, even more generally, in terms of schema - (Beck, 1976) and other theories on anxiety (e.g., Williams, Watts, MacLeod, & Mathews, 1988) that predict a mood-congruent pattern of cognition in anxious individuals. To better understand our results, it may be useful to adopt a cognitive-motivational perspective on selective attention, according to which attention should be regarded as a functional and *dynamic* process that serves motivational purposes (e.g., affect regulation, goal-directed behaviour). Assuming that attention to threat is mediated by the aversive motivational system, the cognitive-motivational view has proposed that attentional processes can be divided into two major components: (1) *initial orienting*, which is dependent on automatic stimulus evaluation and evokes enhanced attention to threat and (2) *maintained attention*, which may be subject to both vigilance and avoidance responses (Mogg & Bradley, 1998). Consistent with this view, a range of studies have demonstrated that the focus of attention in anxious individuals is characterized by a tendency to shift attention towards threat at a pre-attentive

stage of processing, which serves to interrupt ongoing behaviour in order to deal with the potential threat, followed by avoidance strategies at later stages as a means to reduce subjective distress (e.g., Calvo & Avero, 2005; Koster, et al., 2005; 2007; Rohner, 2002).[3] Such vigilance-avoidance responses are likely to interfere with habituation to threat and as such maintain anxiety in the long run. In this respect, it can be noted that we did present our stimulus material for 500 ms, which is sufficient to allow more than one shift of attention between stimulus locations. Hence, both vigilance and avoidance can occur at this SOA. Furthermore, an SOA of 500 ms allows conscious awareness of the stimulus material, which may elicit goal-oriented attentional responses that are influenced by past and current attachment concerns.[4] Based on the cognitive-motivational view, our findings may thus possibly indicate that attentional responses in both anxious and avoidant individuals are primarily driven by harm-avoidance goals. Given that both anxiety and avoidance originate from a history of unsupportive attachment experiences, it can be speculated that it is functional to both types of attachment insecurity to rapidly detect and then defensively orient attention away from information that makes salient their underlying fear.

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[3] In deriving hypotheses on the attachment-attention link and explaining our results, it is intuitively appealing to rely on cognitive theories of trait anxiety. We have to bear in mind, however, that although trait anxiety and attachment anxiety are conceptually related and do share common variance in accounting for individual differences, they are not redundant. Correlations between trait anxiety and attachment anxiety are moderate at best (.54 on average) and in most studies on attachment-style differences the obtained effects cannot be explained by trait anxiety (see Chapters 1 and 3, also see Mikulincer et al., 2002). Hence, we cannot simply assume that the same attentional mechanisms will underlie both types of anxiety, especially when considering attachment anxiety as a developmental construct that is interpersonally oriented and strongly influenced by attachment-related concerns of proximity and rejection. In this respect, it could be that attachment anxiety, especially in combination with attachment avoidance, shows more overlap with social anxiety rather than general anxiety. Note that studies on attentional processing in social anxiety did also show attentional avoidance of interpersonal threat stimuli at 500 ms (e.g., Chen, Ehlers, Clark, & Mansell, 2002). In addition, given that fearful attachment is thought to develop out of traumatising experiences, our results are also compatible with recent studies on PTSD in children demonstrating an association between maltreatment and attentional avoidance of threatening faces at 500 ms (Pine, et al., 2005).

[4] Although it may not be completely accurate to talk about 'maintained attention' (which actually refers to attention at stimulus durations longer than 500 ms), it is still plausible to assume that more strategic attentional responses are activated when stimuli are presented for 500 ms.

Although it may seem plausible to assume that both types of insecurity are associated with heightened activation of the fear-system and thus yield a similar pattern of processing attachment threat, considerable evidence has shown that attachment anxiety and avoidance are associated with different regulatory efforts that lead to different emotional responses (for an overview, see Mikulincer & Shaver, 2007). Also note that the studies reported in Chapters 4 and 6 revealed that anxious and avoidant individuals display different distress-reactions in response to separation threat. Alternative interpretations that focus on potential differences should thus be considered. First, differences may occur at later, more elaborate stages of processing. Because longer stimulus presentations are likely to evoke ruminative responses (see Mogg & Bradley, 2005), it can be expected that the focus of attention of anxious individuals will shift towards vigilance to threat, whereas avoidant individuals would maintain their avoidant attentional style. This assumption fits with a proposal by Niedenthal and colleagues (2002) that differences in the perceptual style of the two insecure attachment dimensions emerge only at a later processing-stage. Another consideration is that different goal-structures may underlie the tendency of anxious and avoidant individuals to avoid emotionally relevant information. Importantly, different motives could give rise to similar attentional effects. Hence, attentional avoidance does not necessarily reflect an underlying avoidance motive, but may also be driven by appetitive motivational features (Gray & McNaughton, 2000; MacLeod, Rutherford, Campbell, Ebsworthy, & Holker, 2002). In the case of attachment avoidance, directing attention away from interpersonal threat words may serve to keep arousing material away from awareness as a means to ultimately avoid proximity needs and maintain independence. In anxious individuals, on the other hand, interpersonal threat stimuli may be avoided because such information is incongruent with their goal of maintaining proximity to the attachment figure. Appetitive and aversive motives are thus likely to function together in determining attentional biases. This could become problematic in the case of attachment anxiety because it has been argued that these individuals display heightened sensitivity to both reward signals (e.g., proximity) and aversive states (e.g., rejection and attachment figure unavailability), which makes them prone to ambivalence (see Mikulincer & Shaver, 2007; Simpson et al., 1992, Vogel & Wei, 2005). The simultaneous activation of goals and anti-goals may be, to some extent, reflected in the results

of Chapter 2 in which attachment anxiety was found to predict attentional avoidance of both positive and negative face expressions. Another way of explaining this result is that attachment styles act early on in the regulation process by altering the emotional significance of the stimuli. In relation to this, it has been argued that cognitive responses in anxiously attached individuals are mediated by an oversensitive threat *appraisal* system that causes them to interpret all incoming information in terms of potential rejection or unmet attachment needs (Fraley & Shaver, 1998; 2000; see also Mogg & Bradley, 1998). As such, attentional avoidance of positive stimuli may also serve to regulate negative affect. In a related vein, it can be speculated that avoidant individuals direct attention away from attachment information because these stimuli have less subjective meaning to them (due to attachment system deactivation).

The fact that so many different interpretations can be generated to explain the attachment-attention link indicates that we lack a clear understanding of the time-course of attention and the motives that drive attachment-related processes. Hence, to make further progress in the attachment domain, it will be important to further clarify the dynamic relation between attention and mood regulation as a function of attachment style, and to examine in what way this relation changes over time and is influenced by motivational states. Research on the attachment-attention link could therefore benefit from including measures of mood, psycho-physiological recording, and reports of emotional functioning. Furthermore, it will be important to directly examine the influence of goals on attentional processing of positive and negative stimulus material (using goal-priming techniques, see Förster, Liberman, & Friedman, 2007; Gollwitzer, & Moskowitz, 1996).

The Dynamics of Proximity Seeking

The complexity of affect regulation dynamics can also be observed in research on proximity seeking and points to some important issues that need to be specified and further explored in attachment research. Proximity seeking in the context of attachment system activation involves the interplay between approach and avoidance motives oriented at attaining felt security. Such approach and avoidance motives can be activated at different stages of the

regulation process and are organized differently depending on one's history of attachment experiences (see Collins & Allard, 2001, Collins et al., 2004). This complicates theoretical predictions on proximity seeking, because we must take into account that the influence of approach and avoidance goals on proximity-related responses may differ at different levels of the goal-hierarchy and at different points along the timeline of emotion regulation.

For instance, it is likely that at some point in the regulation process and under certain conditions, avoidant individuals will experience a need for closeness towards the attachment figure (e.g. Mikulincer et al., 2000). However, their fear of intimacy and need for independence may block or inhibit the expression of proximity seeking at other points in the regulation process (e.g., Fraley & Shaver, 1998; Mikulincer et al., 2002). The same applies for attachment anxiety. Although their intense wish for proximity and support may produce vigilant responses and a preparedness to engage in proximity seeking (see Chapters 3 and 4), this preparedness may not be translated directly into overt behaviour because of competing goals related to support unavailability and worries about rejection and abandonment (e.g., Fraley & Shaver, 1998; Mikulincer et al., 2002; Simpson et al., 1992). Given that their desire for closeness as well as their sensitivity for rejection each take a central position in anxious individuals' goal-hierarchy, these conflicting motives are likely to generate ambivalence towards proximity seeking and approach-avoidance conflicts when they are activated simultaneously at a given point in the regulation process (e.g., Simpson et al., 1992; Vogel & Wei, 2005). The dynamic course of goal-pursuit may thus partly explain why several studies failed to find a significant association between attachment anxiety and support seeking. Some studies even demonstrated a negative relationship (for a review, see Mikulincer & Shaver, 2007, p.196-199; also see Chapter 5).

Another dynamic aspect that complicates research on proximity seeking is the fact that there is no linear relationship between approach-avoidance goals, action tendencies, and behaviour (see Elliot, 2006; Elliot & Church, 1997; Elliot & Trash, 2002). That is, the same behavioural response can be adopted in the service of both approach and avoidance goals, and the same goal can be

manifested in both approach and avoidance responses.[5] Especially in the case of attachment anxiety, it is not clear whether cognitive and behavioural responses towards the attachment figure are driven by an underlying approach or avoidance motive. Neither is it clear whether and how these motives are hierarchically linked. Anxious individuals may, for example, approach their attachment figure to gain closeness and support, but this desire for closeness may primarily serve to prevent attachment figure unavailability and abandonment. This may be further linked to self-protective goals. That is, because anxious individuals appraise themselves as weak, vulnerable, and unable to cope with threat autonomously, they compulsively rely on their attachment figure to defend themselves against the prospect of relationship-loss. It becomes even more complicated when considering that the dynamic relationship between approach-avoidance goals and proximity-related responses may change during the course of the regulation process. Accordingly, proximity responses may operate in the service of approach goals at one given moment in regulation and serve avoidance goals at another moment.

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[5] Identifying the specific motives that drive proximity-related responses may be of crucial importance for understanding attachment-style differences in emotion and behaviour regulation, especially when considering that goal-pursuit may evoke different effects and emotions when it is impelled by different underlying motives. In this context, it is worth highlighting that avoidance motivation is, by definition, aversive in nature because it can lead only to the absence or presence of a negative outcome. The constant monitoring of negative possibilities is draining and may be experienced as stressful, even when effective in preventing or escaping from a negative outcome. Furthermore, it has been argued that avoidance motivation may damage relational functioning and self-regulation and, eventually, well-being (Elliot & Sheldon, 1997; 1998). This may be contrasted with approach motivation that focuses on a positive goal-object for regulation and can therefore lead to the presence or absence of a positive outcome, which evokes different effects and emotions (Elliot, 2006; Mowrer, 1960). For example, approaching in order to avoid is likely to elicit different emotions than approaching through approach motives (see "relief" versus "joy", Roseman & Evdokas, 2004). Assuming that avoidance-oriented motivational processes underlie insecure attachment, it can be speculated that anxious and avoidant individuals are chronically preoccupied with avoiding negative outcomes, even when danger is not imminent (see Chapters 3 and 4). As a result, they are likely to miss positive opportunities. In addition, the over-utilization of avoidance motivation may, in a self-fulfilling way, produce the very negative outcomes that it is designed to avoid. This may in part explain why avoidant individuals do sometimes experience higher levels of physiological arousal in response to a distressing context (e.g., Diamond, Hicks, & Otter-Henderson, 2006; Dozier & Kobak, 1992) and why anxious individuals do not attain a sense of security through proximity seeking.

The Dynamics of Attachment Representations

The dynamic nature of the attachment system also has important implications for attachment representations. Because working models are built within the context of the attachment system, attachment representations should be regarded as dynamic constructs that are activated or inhibited in the service of affect regulation. This implies that regulatory processes influence which goals, beliefs, and expectations are activated at a given moment in the regulation process and these representations will, in turn, modify or regulate subsequent processes. This dynamic and reciprocal relationship between representations and processes makes it difficult to investigate the specific content of working models, because attachment representations may change depending on the specific context, level, and timing in regulation. Another important implication of this dynamic view is that people with different attachment styles may not differ that much in the *content* of their attachment schemas, but rather in the *processes* that influence their impact on affect-regulation. It can thus be speculated that secure, anxious, and avoidant individuals may share, to some extent, similar knowledge or goals, but differ in the degree to which these constructs are easily activated or inhibited. Strong affect, competing motives, and regulatory efforts may all interfere with the application of certain knowledge within a specific situational or relational context (see also Turan & Horowitz, 2007).

Given that self- and other-views are central to attachment theory, we focus on these specific beliefs to illustrate the dynamic relationship between affect regulation and attachment representations. The existing evidence on self- and other-esteem reveals an interesting pattern of results. Anxious individuals are consistently found to hold a negative self-concept (see also Chapter 6), whereas the results on other-evaluations are less consistent. In the case of attachment avoidance, in contrast, previous studies showed a negative association with other-evaluations, but inconsistent evidence on the self-concept (for a review of studies on self- and other-evaluations as a function of attachment style, see Mikulincer & Shaver, 2007). Drawing on a dynamical and motivational account, it can be speculated that both anxious and avoidant individuals harbour negative feelings about themselves and others (determined in part by their history of negative attachment experiences), but that motivational tendencies distort these appraisals in the service of affect regulation. Because of their negative self-view, anxious individuals primarily rely on others for help with affect regulation,

which may cause them to suppress negative features of the attachment figure in order to make him/her approach-friendly. Avoidant individuals, in contrast, may be more likely to suppress negative self-traits, because they value independence and primarily rely on themselves to regulate emotions. Partial support for these hypotheses has been obtained by Mikulincer and colleagues (2004) who demonstrated defensive suppression of negative self-traits in avoidant individuals by imposing a cognitive load during an emotional Stroop task with self-relevant and -irrelevant words (see Chapter 6). Inhibition and suppression in the context of other-evaluations have not yet been investigated. Furthermore, it can be speculated that the negative self-view associated with attachment anxiety and the negative other-view associated with attachment avoidance are also subject to motivational distortions.

The above analysis makes clear that, when investigating the specific valence associated with self- and other-representations, we should take into account the regulatory processes that organise self- and other-knowledge and the goals that mediate their impact on affect regulation. In other words, it may be more useful to examine the motivational, rather than the affective valence associated with self- and other-representations (see Robinson & Berridge, 1993, 2001; Elliot, 2006; Elliot & Church, 1997). Also note that the affective, dynamic components of working models may be best captured by implicit measures (see Pietromonaco & Barrett, 2000).

Interindividual Differences are not Fixed

In the previous part, we have discussed the complexity of attachment system dynamics. Another issue that complicates attachment research is that attachment styles, and their effect on representations and processes, may vary within a given individual depending on the situational and relational context. Through the years, attachment phenomena have been examined in a variety of contexts (no prime, relational distress prime, non-relational distress prime, supraliminal prime, subliminal prime), using different types of attachment style measures (categorical, dimensional, self-report, interview), and adopting different approaches to assessing attachment style (as a general trait variable or as a specific relational variable). This variation may, in part, account for some of the inconsistencies in the existing literature and may reflect the current debate

regarding the context-sensitivity of attachment styles (Collins et al., 2004; Pietromonaco & Barrett, 2000). Given that adults have a broad range of attachment relationships (e.g., partner, friend, parent, colleagues), it has been argued that attachment styles do not reflect only between-subjects variability, but can also be regarded as a within-subject variable that may vary across close relationships and within a given relationship depending on the situational context. At present, little is known, however, about the interplay between state (specific) and trait (global) attachment styles. Furthermore, it is unclear whether or not context can erase individual differences that have been developed over time in close relationships and therefore it is useful to systematically explore how situational and relational context influence attachment strategies (see Gillath & Shaver, 2007).

Regarding the association between situational context and attachment style within a specific relationship, the studies presented in Chapter 4 suggested that attachment anxiety is related to approach responses towards the attachment figure independent of context (neutral, relationship-threat, ego-threat). In addition, when aggregating studies 2 (separation threat) and 3 (positive prime) of the attentional bias studies towards the attachment figure into one study-design (Chapter 3), attachment anxiety showed an independent main effect on attentional responses. No main effect of prime condition was found, neither an interaction effect between prime condition and attachment style. The same applies to the studies on proximity and distance goals. When re-analysing the results of studies 1 (no prime) and 2 (separation-prime) of Chapter 5 in a between-subjects design, a significant main effect emerged of attachment avoidance, but no main effect of context and no interaction effect. This seems to indicate that the relation between proximity-related responses and relationship-specific attachment style did not vary depending on situational context. On the other hand, we need to be careful in interpreting these results because in some of these studies low power may partly account for the lack of interaction effects. Furthermore, it remains remarkable that the induction of a separation threat almost consistently (except Chapter 5) evoked an effect of attachment anxiety, but not of attachment avoidance. In this context, several studies using 'separation reminders' have revealed that individuals with different attachment styles differ in the degree of (reported) distress associated with separation thoughts,

suggesting that there are differences in the salience of separation threat.[6] More precisely, separation from the attachment figure touches on a core theme in anxious individuals, which is likely to reactivate their negatively valued interpersonal expectations and as such intensify their experience of distress through ruminative responses and exaggerated threat appraisals (e.g., Mikulincer, Florian, Birnbaum, & Malishkewitz, 2002). The induction of separation threat may, however, be less salient to activate avoidance-related processes, because the defensive strategies of avoidant individuals are thought to discourage the processing of relational threat to prevent that distress will be experienced and attachment needs become salient (e.g., Fraley & Shaver, 1997; Fraley et al., 2000). In support of these assumptions, the studies in Chapters 5 and 6 did indeed demonstrate that anxious individuals report less positive feelings (coding of spontaneous responses) and more distress (as measured by VAS scales) in response to an imagined separation. When coding the spontaneous responses of avoidant individuals, they were found to report less negative feelings and, in fact, less thoughts and feelings overall. Hence, it could be that imagining a hypothetical separation from the attachment figure has made anxiety-related constructs temporally more accessible, which may have facilitated the processing of attachment-related cues. The greater the current accessibility of anxious working models, the more likely that an individual will perceive the social environment, react emotionally, and behave in a highly anxious way (Simpson & Rholes, 2004). In any case, systematic research (with larger samples) is needed to investigate the specific contribution of context and attachment style in order to better understand to which extent the obtained results reflect one's stable attachment style and/or temporal fluctuations related to the use of a specific prime. Moreover, future research should systematically include measures of both state and trait attachment style in order to determine

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[6] It can also be argued that not all relational and situational contexts will necessarily evoke attachment processes to the same extent in all individuals (e.g., Simpson & Rholes, 2004). For example, secure individuals may rely on others in the service of attachment needs only when they experience an intense threat to the self. Anxious individuals, on the other hand, may see many situations as threatening and have therefore a greater need to regulate their affect than secure individuals. Avoidant individuals are less likely to consciously experience threat and will inhibit attachment needs, indicating that they are less emotional reactive (see Pietromonaco & Barrett, 2000, on individual differences in emotional reactivity).

the relative ability of both types of attachment variability to predict cognitive, emotional, and behavioural responses.

In addition to varying situational context, it may also be extremely useful to determine whether the cognitive and motivational processes that we have studied in this dissertation are stable across relationships. This may be particularly important in the case of attentional processes because it has been argued that attentional biases towards emotional, attachment-related information contribute to the perpetuation and generalization of one's attachment style (e.g., Bowlby, 1973; Main et al., 1985). Accordingly, the study of automatic processes (and representations) may be informative in itself to gain a clearer understanding of the relationship between specific and global attachment styles. In relation to this, we need to remark that the studies on attention towards threatening information presented in Chapters 1 and 2 were conducted in the absence of a specific relational context, while we did measure attachment style referring to a specific attachment relationship. Considering that attachment processes may differ across relationships, this could possibly complicate the interpretation of our findings. Note however that the relationship-dependence of attachment processes (and representations) still needs to be tested.

In general, more research is needed to systematically investigate the relationship between state (specific) and trait (global) attachment. Collins and colleagues (2004) have made several suggestions in this respect and, among these, it is intuitively most appealing to assume that insecure attachment represents a vulnerability factor that may or may not be expressed, depending on the situational and relational context. Another assumption is that trait attachment shapes relational experiences and as such shapes relationship-specific attachment styles (also see Simpson & Rholes, 2004). In both cases, it will be important to determine in what way processes such as attention, inhibition, memory, interpretation, and appraisals play a role in the expression of attachment styles within and across relationships. In addition, it may be interesting to focus on the flexibility with which individuals shift across attachment working models as they change relationship contexts (see Pietromonaco & Barrett, 2000, on 'attachment trajectories') and to which extent this (lack of) flexibility is mediated by attachment processes. 'Flexibility' may be an important feature that differentiates between secure and insecure attachment (Zimmerman, 1999). In relation to this, we want to emphasize that hyperactivating and deactivating

strategies should not be regarded as inherently problematic, because such strategies may reflect adaptive mechanisms in the context of relationship development and functioning (Bowlby, 1980). Accordingly, even secure individuals may, from time to time, react to attachment figure unavailability in a clinging or avoidant way. Only when established as habitual coping strategies that are applied regardless of context and with great intensity, hyperactivation and deactivation are likely to contribute to psychological and social difficulties. To gain deeper insight into the relative influence of relationship-specific and global attachment styles,[7] it will thus be of great value to study the rigidity and intensity with which individuals rely on hyperactivating or deactivating strategies within and across relationships. The relationship-dependence of attachment styles also points to the importance of including relationship-information when studying attachment processes (e.g., relational functioning, the attachment style of the attachment figure, his/her (actual) responses to attachment needs and so on). This may allow us to examine, for example, whether particular patterns of (in)security are tied to particular patterns of attachment figure responsiveness. Furthermore, the inclusion of relationship-information may allow investigating whether automatic cognitive and behavioural processes mediate relationship functioning.

How are (Measures of) Attachment Dimensions Related?

Finally, the study of attachment-style differences is also complicated by the fact that we rely on a measure of attachment dimensions that has been deduced from attachment theory and is therefore in itself biased by theoretical predictions. Interestingly, almost all of our studies revealed a significant

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[7] It has been proposed that attachment styles are organized in a hierarchical structure, with at the top of this hierarchy the *global* attachment style, which represents generalized information about repeated interaction patterns in a variety of attachment relationships, and at a lower level, *relationship-specific* attachment styles that may or may not be congruent with one's global attachment style (e.g., Collins & Read, 1994). In relation to this, it has been argued that the number of significant relationships of each attachment style that a person reports may reveal important information on his/her global attachment style and may also inform us about the rigidity of attachment styles (see Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996; Rowe & Carnelley, 2003, 2005).

correlation between the attachment anxiety and avoidance dimensions, which is not compatible with the theoretical assumption that the motivational tendencies underlying anxiety and avoidance yield independent and opposite effects (e.g., Fraley & Shaver, 2000). This has important implications for the interpretation of our results. We observed that differences among the insecure attachment dimensions were less distinct than would have been expected based on attachment theory. Do we need to consider this as a theoretical inconsistency or is this the result of the way we measured attachment style? To address this methodological loop, attachment research should take a multi-method approach to the study of individual differences by including multiple indicators of attachment style, such as physiological correlates, spontaneous behaviour, implicit measures of attachment style (e.g., Anxiety-Avoidance IAT), and questionnaires. In this context, we need to remark that numerous studies using self-report measures of attachment style have revealed theoretically predictable associations between self-reported anxiety and avoidance and a variety of implicit measures, physiological reactivity, and observed behaviour (e.g., Baldwin, Fehr, Keedian, Siedel, & Thompson, 1993; Baldwin et al., 1996; Fraley & Shaver, 1998; Mikulincer et al., 2002, 2004; Zayas & Shoda, 2005). Note, however, that findings were often not consistent across studies, especially regarding the physiology of attachment avoidance and the proximity behaviour of attachment anxiety (cfr. supra, on attachment dynamics). Although these studies have been taken as evidence for the validity of attachment-style questionnaires as measures of individual differences in implicit processes and representations, it remains problematic that the value and validity of self-report is determined on the basis of its ability to empirically reproduce the assumptions postulated by the theory, while the theory itself has served as the primary source of inspiration from which the questionnaire-items were deduced. Nevertheless, at this point, we have no other criterion to determine individual differences in anxiety and avoidance and we do need to rely on some theory to investigate the relation between attachment differences and regulatory processes and representations. The central idea of the above reasoning is that we must be aware that measures of attachment style, such as the ECR, are just one possible lens through which to look at attachment differences and we need to bear in mind that this lens may produce a biased view. In the limitations-section, we will provide several arguments that promote further use of attachment-style questionnaires.

General Conclusion

It is widely agreed that two independent dimensions (i.e., attachment anxiety and avoidance) underlie individual differences in attachment. Both dimensions have been associated with distinct regulatory strategies (i.e., hyperactivating and deactivating) that have been approached empirically and conceptually as yielding independent and opposite effects on cognition, emotion, and behaviour. In support of this, a variety of studies have demonstrated that attachment anxiety and avoidance are associated with different responses in different contexts. The studies presented in this dissertation also provided evidence that particular priming-conditions evoke different responses in anxious and avoidant individuals (see Chapters 4 and 6) and that attachment-related differences occur in attention allocation, automatic proximity-related responses, and automatically activated representations (Chapters 2, 3, 4, 5, and 6). Results to date do, however, not support the view that the effects of attachment anxiety on emotional and behavioural responding are the simple opposite of the effects of attachment avoidance. Current evidence suggests a much more complex pattern of relations. Throughout this general discussion, we have put forward some theoretical and empirical concerns that may account for this complexity. Most importantly, we have suggested that attachment theory and research should pay more attention to the dynamical nature of the attachment system that continuously changes over time, context, goals, and level of responding. We have also discussed the multidimensional nature of attachment representations and processes that may vary within a given individual depending on the situational and relational context (i.e., within- and between-person variability). Finally, we have pointed to the (in)dependence of attachment-style measures.

Several important implications follow from the dynamical and multidimensional view on attachment. First, the fact that the attachment system includes multiple components, processes, and emotional circuits that may operate in parallel, synchronously, or in conflicting ways at different levels and times of the regulation process, complicates theoretical predictions and may raise concerns about the integrative span of the attachment model. That is, almost every result can be explained by this model, which implicates that the theory cannot be falsified. Secondly, it is virtually impossible to capture the complexity of attachment dynamics into one single model. A clear understanding of attachment dynamics will thus require to develop 'micro-models' that focus on

specific components and mechanisms involved in attachment-system activation and functioning. This decompositional approach may allow us to further specify the theoretical predictions on individual differences in attachment strategies. A third implication is that we need to consider that, when attachment is measured at one point in time, the findings may not always generalize across time or context for a given individual.

Accordingly, it will be important for further research to systematically identify at which levels of measurement, under which conditions (in terms of context and stimulus material), and regarding which processes and representations, attachment anxiety and avoidance yield different or similar effects. A systematic analysis of the commonalities and differences among the anxious and avoidant forms of emotion regulation may lead to an increased understanding both of these specific regulatory strategies as well as of attachment system functioning in general. Furthermore, research should focus more on the secure-insecure distinction when studying automatic processes and representations, because this could be useful for understanding the source of differences between functional and dysfunctional emotion regulation in the context of attachment.[8]

DIRECTIONS FOR FUTURE RESEARCH

Throughout the discussion, some general comments and concerns were raised that need to be considered in future research on attachment system functioning. In this part, we want to formulate some specific hypotheses and research topics that may provide direct guidance for further research.

Our studies on the role of selective attention in attachment system functioning have revealed some interesting data that may guide further examination of attachment-style differences in attention to emotional and attachment-related information. First, it will be important to study the influence of attachment style on pre- and post-attentive processes by varying the presentation time of the stimuli in the attentional task. Secondly, pictures of the real attachment figure (instead of strangers) should be presented because such stimuli are more salient in terms of attachment-system activation and may

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[8] We will elaborate on this at the end of the limitations-section.

therefore elicit stronger or even different attentional effects. In relation to this, it may also be interesting to explore the role of attachment anxiety and avoidance in the appraisal of emotional stimuli by varying, for example, the intensity and potentiality of threat. Finally, given that the appraisal of stimuli is likely to change under distressing circumstances, it can be speculated that the influence of attachment style on selective processing of emotional stimuli will be modulated by the current mood state of the individual. In line with the idea that a challenge to the attachment system is required to trigger attachment strategies, it could be that a sense of subjective distress is needed to activate the presumed attentional styles in anxious and avoidant individuals. The induction of state attachment anxiety (and avoidance) may thus allow us to test a state-trait interaction hypothesis (see also Williams, et al., 1988).

Another important avenue for future research is to investigate other components of attention that could potentially differentiate between attachment anxiety and avoidance at the level of emotional processing. In this respect, Derryberry and Tucker (1994) have demonstrated that trait anxiety does not only influence the orientation of attention, but also the breadth of the focus of attention. Based on attachment theory, it can be predicted that attachment anxiety will be associated with a broader environmental scanning (i.e., vigilant monitoring) followed by a narrowing of attention once threat has been detected. Attachment avoidance, on the other hand, may limit attentional scanning in order to prevent the detection of information that can potentially activate the attachment system. This proposal could be tested by recording cognitive processing of threat that is presented outside the focus of spatial attention (e.g., Ball, Beard, Roemker, Miller, & Griggs, 1988). Note that such a paradigm could also be adopted to explore the monitoring of attachment figure-related cues as a function of attachment style. Another attentional mechanism that should be explored in the context of attachment is inhibitory functioning. Although theoretical accounts of inhibition as a function of attachment are well elaborated, little research has been conducted in this area. This could nevertheless be a crucial step in arriving at a good understanding of the attachment-attention link, because it is likely that the regulatory strategies underlying attachment anxiety and avoidance will differ at the level of inhibitory control (e.g., Baldwin, & Kay, 2003). According to the theory, it can be expected that attachment anxiety will be associated with a deficient inhibitory responding to negative information,

whereas attachment avoidance would be associated with rigid inhibition of negative stimuli. Impaired inhibitory functioning of negative emotional information may lead to ruminative thinking, reports of higher distress, greater emotional reactivity, and increased storage of negative information in memory (see Joorman, 2004; 2006), all of which have been observed in attachment anxiety (e.g., Mikulincer & Orbach, 1995; Mikulincer & Florian, 1995, 1998; Mikulincer et al., 2002). In relation to this, it may also be useful to explore in what way attachment-style differences in selective attention relate to higher-order cognitive processes such as interpretation, memory, and general beliefs about the attachment figure and the attachment relationship.

In addition to further exploring the link between selective attention and attachment, a second important direction for future research is to focus more systematically on (successful and unsuccessful) goal-pursuit as a function of attachment style. More specifically, we need to investigate in which way goal-pursuit is enabled and influenced by the activation and inhibition of goal-relevant knowledge. Regulatory deficiencies may originate from an ill-organized goal-hierarchy. Because the latter is likely to include both goals and anti-goals that continuously compete for access (see Carver & Scheier, 1998), it may be useful to explore at which level, in which context, and at which point in time, proximity and distance goals are activated or inhibited and influence subsequent processing. A prominent hypothesis in research on proximity seeking is that goal-pursuit in anxious individuals is marked by ambivalence. This hypothesis has, however, not yet been directly tested. It will therefore be important for future research to explore whether anxious individuals do indeed experience difficulties in inhibiting goals and anti-goals and how these goals further influence emotional and behavioural responses. Furthermore, future work might use priming techniques for making interpersonal goals temporally accessible (see Bargh, 1997), in order to determine the causal role of goals in shaping relationship perception, information processing, and behaviour. To gain deeper insight into attachment style-differences in goal-pursuit and self-regulation, research should also include measures of goal expectancies, goal-commitment, goal-persistence, and goal-disengagement in the context of close relationships (see Mikulincer & Shaver, 2007).

Third, more direct tests are needed to investigate the role of threat- and goal-related influences on self- and other-appraisals. Such tests may require randomly

assigning subjects to different experimental conditions in which the level and source of motivation and the presence of contextual threat cues is systematically varied. Furthermore, to better understand the relation between attachment style and other-representations, it will be important to systematically examine the hypothesis - raised in recent attachment research - that anxious individuals hold a mixed, ambivalent attitude towards their attachment figure and that this attitude may vary depending on the particular situational context (Mikulincer & Shaver, 2007; Pietromonaco & Barrett, 1997, 2006; also see de Liver, van der Pligt, & Wigboldus, 2007, for a possible procedure to test ambivalent attitudes). In this regard, it is worth noting that, so far, only a few studies have focused on perceptions of the attachment figure and most of this research has been conducted with the use of explicit measures. Hence, more research is needed that includes implicit measures to investigate automatically activated other-representations (e.g., Banse & Kowalick, 2007; Zayas & Shoda, 2005). Future research efforts should also take into account the relationship-dependence and malleability of the self by examining whether one's self-concept varies under different situational and relational conditions (Hinkley & Andersen, 1996). Additionally, because the self- and other-views of anxious and avoidant individuals are assumed to be fragile and defensive in nature (cfr. supra), it may be interesting to explore whether attitudes towards the self and the attachment figure differ when measured at the implicit and explicit level and to specify the joint role of implicit and explicit evaluations in predicting emotional and relational functioning. This may be particularly important when considering that inconsistencies between implicit and explicit features of working models can have a detrimental effect on attachment experiences (Crittenden, 1990; Main, 1990) and on the development of psychopathology in general. Furthermore, assuming that inhibitory processes play a key role in keeping a defensive positive self- and other-view in insecure individuals, this may cause internal tensions and psychological distress, which is likely to result in self-regulatory failures and emotional disturbances. It will thus be of great value for both theory and research to further examine the exact role of self- and other-representations in attachment system functioning, to determine in greater detail which goals they serve, to identify the (automatic) processes that mediate their impact on affect regulation, and to focus on the role of emotions as an organizing force in how people think about themselves and others.

Finally, the majority of attachment research has been based on correlational studies investigating the relation between attachment style and cognition, emotion, and behaviour. Although such studies provide valuable insights on the correlates of attachment anxiety and avoidance, they do not provide direct evidence on the causal role of attachment styles on emotional and behavioural regulation. To this aim, experimental studies are needed that manipulate attachment styles and examine their influence on information processing and automatically activated representations. Given the intra-person variability of attachment styles (cfr. supra), research has demonstrated that specific attachment styles can be made temporarily accessible using priming techniques (e.g., guided visualisation of a specific attachment relationship) and that these primed attachment styles have measurable effects on subsequent processing (e.g., Baldwin et al., 1996; Mikulincer & Arad, 2001; Pierce & Lydon, 2001; Rowe & Carnelley, 2003). In a related vein, experimental studies in which crucial appraisals or processes are manipulated (such as the appraisal of proximity seeking viability or approach-avoidance action tendencies) could provide important information about the selection of particular attachment styles and strategies. In addition to cross-sectional designs, attachment research could also benefit from follow-up studies that allow investigating the predictive value of attachment processes and representations in shaping emotional and behavioural relationship-responses over time.

LIMITATIONS

There are several limitations of the present studies that need to be discussed and deserve further research.

First, because we did not pre-select participants based on their attachment style, our samples did probably not include truly high-anxious and high-avoidant individuals. In combination with the relatively small sample sizes in our studies, this may possibly account for the fact that the obtained effects and correlations were generally small to moderate. Hence, the present findings should be replicated with larger, more representative (i.e., pre-selected) samples. On the other hand, it should be noted that our studies did reveal theoretically meaningful relations, despite the fact that the distribution of our samples - in terms of attachment scores - was not optimal.

Secondly, in all studies, the ECR was administered after the reaction times tasks and in the same experimental session, so we cannot rule out the possibility that the participant's answers on the ECR are affected by thoughts and feelings elicited in the experimental situation. We should not, however, put too much weight on this issue because it is unlikely that participants are aware of the experimental link between their performance on the reaction time task and their responses on the ECR. Furthermore, we think that measuring attachment style before the manipulation would be more problematic because this might activate chronic attachment-related schemas that could affect responses on the reaction time tasks. In any case, it will be important for future research to measure (trait) attachment style in advance (i.e., before the experimental session) in order to exclude the potential influence of order-effects.

Third, the present samples included a disproportionate number of women. This prevented us from investigating possible gender-differences in attachment processes and representations. Although we cannot think of theoretical or empirical reasons to expect such differences in attachment system functioning (see research on the lack of gender differences in attachment style, Schmitt et al., 2003), this issue should receive more careful attention in future research.

Fourth, not all our studies did control for the possible effect of trait anxiety or global self-esteem on our dependent variables. This is nevertheless important in arriving at a good understanding of the relation between attachment style and attachment processes, particularly when investigating attentional biases, because the literature indicates a clear association between attention to threat and trait anxiety (see Williams, Watts, MacLeod, & Mathews, 1997, for a review). In response to this comment, we need to mention that the study in Chapter 1 did demonstrate that the attentional effects were specific to attachment style and could not be accounted for by trait anxiety. Furthermore, there is other accumulating evidence that, although both trait anxiety and self-esteem are closely related to attachment anxiety and avoidance, they consistently fail to explain the psychological effects of these attachment dimensions (e.g., Mikulincer & Florian, 2000; Mikulincer et al., 2000; Mikulincer et al., 2002).

A fifth concern is related to the fact that our samples mainly consisted of students. As a result, great variability exists in the relationship partners that served as a primary attachment figure. Across studies, it could be observed that 49 % of our participants depicted a romantic partner as attachment figure, 27 % a

good friend, 21 % the mother, and 3 % the father. Because too few interactions occurred within each type of attachment relationship and because only about half of the participants were involved in romantic relationships, we did not have enough statistical power to adequately compare response patterns across relationship types. This limitation will need to be addressed in future work that samples a larger number of particular kinds of relationships (e.g., romantic partners and best friends). Although attachment is assumed to operate in the same way throughout the life span, we should bear in mind that important differences may exist between, for example, mother-child attachment in adulthood and romantic attachment, especially in youngsters who are experiencing their first romantic loves. In this context, it is also worth noting that the selection of the primary attachment figure was based on a 6-items self-report scale (i.e., WHOTO scale, Hazan & Zeifman, 1994), which may have elicited responses that are influenced by momentarily amorous experiences. Given that it would take at least 2 years to develop a 'full-blown' attachment relationship (Fraley & Davis, 1997), it is not always certain whether the partner of a 18 to 20-year old student does actually function as a security-provider in real life. On the other hand, we want to emphasize that the studies in which participants had to respond to attachment figure-related cues did reveal theoretically meaningful relationships that differed systematically as a function of attachment style. This precludes an alternative interpretation of our findings in terms of general closeness and intimacy. Nevertheless, when relying on a sample of students, careful attention is needed to specify in detail whether a given relationship actually meets the criteria for an attachment relationship.

Sixth, because the WHOTO scale defines attachment relationships with respect to their security- and proximity-providing functions, one should take into account that this measure is biased towards security-enhancing attachment figures and may thus miss figures to whom a person is more insecurely attached (Trinke & Bartholomew, 1997). This may be an important restriction in terms of the present dissertation, because the majority of our research questions focused on biases associated with attachment anxiety and avoidance in relation to a specific attachment figure. Further research should use other scales, such as the Attachment Network Questionnaire (Trinke & Bartholomew, 1997), to identify a broader range of attachment figures and to examine cognitive and behavioural reactions within diverse attachment relationships. Furthermore, an important task

for future research is to delineate indicators of an attachment relationship that are not confounded with security or insecurity.

Seventh, in most of our studies we used only one type of distress prime to activate attachment processes, and this prime referred to a specific relational threat, namely separation from the attachment figure. As described earlier, the effect of this specific threat prime is likely to vary as a function of attachment style and differences in the salience of separation threat may influence the processing of attachment-related cues. Future research should therefore incorporate both attachment-relevant and -irrelevant situational contexts. We should also note that our distress prime required conscious processing. This may have aggravated the intensifying effect of attachment anxiety on the experience of distress and the defensive reaction of avoidant individuals in response to an imagined separation. In this respect, subliminal priming could offer a solution to circumvent the potentially confounding effects of conscious deliberation and could also be useful to examine the effects of preconsciously activated distress on attachment anxiety and avoidance (see Mikulincer et al., 2000; 2002). Nevertheless, we think that a conscious visualisation prime may still offer valid information because (1) most of the threats that people face in real-life are of a supraliminal kind and probably processed consciously, (2) subliminal priming effects, especially word-priming, are short-lived and unstable (Bargh, 1989; Becker, Moscovitch, Behrmann, & Joordens, 1997), and (3) it seems unlikely that our participants consciously and deliberately attempted to shape their responses in a self-enhancing or hypothesis-confirming way, because they were generally not aware of the research aims. Also note that, when using a visualisation task, the activation of distress and its subsequent effects on information processing may still be called automatic in the sense that they occur efficiently and in the absence of intention, awareness, and control (see Moors & De Houwer, 2006). As a final remark on the priming-issue, we want to note that our threat primes were relatively benign and hypothetical, which may have produced less intense distress reactions (especially in secure individuals). This may, in turn, partly account for the relatively small effects observed in our studies. Further research should examine attachment processes and representations in the context of actual threat or after imagining an idiosyncratic and real-experienced threat situation.

Eight, the exclusive reliance on self-report measures to assess individual differences in attachment style may possibly complicate the interpretation of our findings (cfr. supra). Because self-report scales involve conscious, deliberate answers that can be biased by cognitive limitations, social desirability concerns, and other motivational tendencies, it could be argued that measures such as the ECR and the RQ cannot provide a valid index of one's attachment orientation. Although self-report may indeed be limited to indexing only conscious appraisals, several arguments can be raised that promote their value and further use in attachment research (see also Mikulincer & Shaver, 2007; Shaver & Mikulincer, 2002). First, because people spend a great deal of time thinking about their close relationships, most people have sufficient experience to provide valuable information about their relationship cognitions, feelings, and behaviour. Secondly, self-presentation tendencies may be part of attachment-related strategies. For example, avoidant individuals may deliberately present themselves as autonomous and distant because this fits their goal of independence. For the same reason, anxious individuals may present themselves as emotional, weak, and vulnerable as a means to elicit support from the attachment figure. Also note that, although motivational tendencies may have a different influence on self-reported and automatic responses, research has shown that automatic and controlled processes can also operate in the same direction to achieve a goal and that implicit motives are often manifested in conscious appraisals (Chartrand, & Bargh, 2002). Accordingly, the subjective nature of self-report measures does not necessarily impose a constraint on their validity to tap attachment styles. Third, it can be argued that people are typically not aware that their responses on a questionnaire such as the ECR are influenced by past attachment experiences stored in attachment working models. Accordingly, it can be speculated that self-report questionnaires do reflect, to some extent, automatically activated attachment working models (see De Houwer, 2006, 2007). Nevertheless, it may be an important challenge for future research to develop implicit measures of attachment style and to investigate their relation with attachment processes and representations, in combination with explicit reports of attachment anxiety and avoidance.

A final issue concerns the fact that our research questions primarily focused on the cognitive-motivational mechanisms associated with attachment anxiety and avoidance. Little attention has been devoted to discussing possible

implications of our results regarding the psychology of attachment security. Note that some of our results may nevertheless speak to the issue of attachment security, because several studies did also investigate the normative component of attachment system functioning (i.e., primary attachment strategy), which largely corresponds with security-based strategies. On the other hand, when focusing specifically on the relation between attachment security, as measured by the ECR, and attention, action tendencies, goals, and self-representations, none of our studies did actually demonstrate a significant relationship with attachment security as defined by low scores on anxiety and avoidance. The lack of association with attachment security may be, to some extent, explained by the fact that the ECR is probably not an optimal measure for assessing attachment security. Because the ECR can provide only scores on the two insecurity dimensions, it has been argued that this questionnaire better assesses the high ends of the anxiety and avoidance dimensions than it does the low or secure ends of each dimension (e.g., Fraley, Waller, & Brennan, 2000).[9] In relation to this, several researchers have made some interesting recommendations to improve the measurement of attachment styles. One of these suggestions is to rotate the axes of the two-dimensional space (along the secure-fearful axis and the anxiety-avoidance axis) and to devise a unidimensional scale that measures individual differences in attachment security versus insecurity. This measure would be particularly useful for examining the specific characteristics of attachment security, because the latter should no longer be studied in terms of the vague absence of anxiety and avoidance. Theory and research on attachment security (see Mikulincer & Shaver, 2004; 2007) clearly indicates that this attachment pattern is characterized by several unique features that are distinct from attachment insecurity (e.g., coping with distress in terms of open cognitive processing, functional emotion regulation and adaptive, flexible behaviour). The ECR or ECR-R could then be used in studies that focus more explicitly on the

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[9] Unfortunately, we did not systematically include other attachment-style questionnaires that can provide an index of attachment security, such as, for example, the Relationship Questionnaire (Griffin & Bartholomew, 1994). Note, however, that other questionnaires have been criticized as well. The RQ, for example, may cause interpretative difficulties because this questionnaire is derived from the prototypical approach on attachment and contains single-item scales, which are subject to reliability-problems and measurement errors (see Thurstone, Likert). Also note that we did include the RQ-measure in our study on the implicit self-concept (Chapter 6), but we could not find a relationship between attachment security and implicit self-representations.

vulnerabilities underlying specific forms of attachment insecurity, namely anxiety and/or avoidance. Note that this two-sequential measurement procedure may also fit well with the process-model of Mikulincer and Shaver (2003) in which perceived attachment figure (un)availability and the associated sense of felt (in)security constitute a key difference in attachment system functioning. Hence, a task for future research will be to create a measure for assessing overall attachment security.

Finally, we should note that the ECR has been criticized for other reasons as well. Importantly, the ECR-anxiety scale has only one reverse-coded item and all other items are formulated negatively, which makes this subscale vulnerable to response biases. In addition, the ECR-avoidance scale primarily consists of positively formulated items that must be reverse-coded. This could possibly affect the relationship between the avoidance dimension and attachment correlates (especially in the case of positive relationship-responses). The aforementioned comments indicate that, despite the widespread use of the ECR in attachment research, further developments are needed in the measurement of self-reported attachment style.

Despite these limitations, the studies reported in this dissertation make a number of significant contributions to attachment research. Given the growing interest in the automatic processes underlying attachment system functioning, the present studies provide an important first step in exploring the attentional processes and motivational tendencies associated with attachment anxiety and avoidance, and addressed the need for additional research on the implicit content of attachment working models. We hope our findings will encourage researchers to further explore the role of both implicit and explicit processes in social judgement and behaviour, and to broaden their scope on attachment dynamics by studying the interface between information processing, motivation, and emotion regulation. Such a multilevel approach will be of key relevance to better understand the regulatory processes and cognitive structures that contribute to the development and maintenance of attachment (in)security.

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NEDERLANDSTALIGE SAMENVATTING

De hechtingstheorie (Bowlby, 1962, 1982) is een zeer invloedrijk theoretisch model in het onderzoek naar interpersoonlijke relaties. Deze theorie postuleert dat relationele ervaringen uit het verleden opgeslagen worden in mentale representaties die automatisch geactiveerd worden in hechtingsrelevante situaties. Eens geactiveerd, hebben deze representaties een directe (en vaak automatische) impact op cognitieve processen, emotionele appraisal en gedrag (Collins, Guichard, Ford, & Feeney, 2004). Deze mentale representaties en cognitief-motivationele processen functioneren samen in een hechtingsgedragssysteem, dat gezien kan worden als een emotieregulatie-systeem dat geactiveerd wordt in een bedreigende context en primair gericht is op het bekomen van veiligheid door nabijheid te zoeken ten aanzien van de hechtingsfiguur. Een belangrijke assumptie van de hechtingstheorie is dat er individuele verschillen bestaan in de activatie en regulatie van het hechtingssysteem, op basis waarvan er verschillende *hechtingsstijlen* onderscheiden kunnen worden (zie Mikulincer & Shaver, 2007, voor een review over hechtingsverschillen).

Veilige hechting ontstaat vanuit steunende interacties met een beschikbare en responsieve hechtingsfiguur en wordt daarom gekenmerkt door positieve overtuigingen over zichzelf en anderen. Veilig gehechte individuen zijn in staat om hun emoties op een constructieve manier te reguleren door middel van probleemoplossende vaardigheden, cognitieve reappraisal, en het zoeken van nabijheid ten aanzien van de hechtingsfiguur, al zijn ze zich ook bewust van hun eigen coping-vaardigheden. Onveilige hechting, daarentegen, wordt gekenmerkt door een historiek van verwerpende, afwijzende of inconsistente zorg van de hechtingsfiguur. Omdat onveilig gehechte individuen herhaaldelijk ervaren hebben dat het zoeken van nabijheid ten aanzien van de hechtingsfiguur niet effectief is in het reduceren van angst, dienden ze alternatieve strategieën te ontwikkelen om met gevoelens van onveiligheid en ontreddering om te gaan. Algemeen worden er twee vormen van onveilige hechting onderscheiden. Elk van beide zou worden gekenmerkt door specifieke regulatiestrategieën die verondersteld worden een tegenovergesteld effect te hebben op het verwerken van emotionele informatie en het reguleren van nabijheidzoekend gedrag. **Angstige** hechting wordt getypeerd door *hyperactiverende* strategieën die zich

manifesteren in hypervigilantie voor bedreigende informatie, catastroferende appraisals, ruminatie, intense angstreacties, hevige negatieve emoties, een negatief zelfbeeld, en overdreven, persistent nabijheidzoekend gedrag ten aanzien van de hechtingsfiguur. **Vermijdende** hechting, daarentegen, wordt gekenmerkt door *deactiverende* strategieën die gericht zijn op het inactiveren van het hechtingssysteem door het vermijden van emotionele en hechtingsgerelateerde stimuli en het onderdrukken van nabijheidzoekend gedrag. Vermijdende individuen hechten veel belang aan onafhankelijkheid, houden (emotionele en fysieke) afstand ten aanzien van de hechtingsfiguur en steunen vooral op zichzelf in het omgaan met gevoelens van onveiligheid (die ze in de eerste plaats trachten te onderdrukken).

Hoewel er algemeen aangenomen wordt dat het hechtingssysteem hoofdzakelijk gedreven wordt door automatische processen (Baldwin, 1992, 1995; Collins et al., 2004; Mikulincer & Shaver, 2003, 2007), is er nog maar weinig onderzoek verricht naar de impliciete inhoud van hechtingsschema's en de specifieke cognitief-motivationele processen die betrokken zijn in de activatie en regulatie van het hechtingssysteem. Dat kan gedeeltelijk toegeschreven worden aan het feit dat men in het verleden vrijwel uitsluitend gebruik maakte van zelfrapportagematen, die evenwel beperkt zijn tot het meten van bewust toegankelijke inhouden. Recent worden er daarom steeds vaker experimentele paradigma's gebruikt, die toelaten om hechtingsgerelateerde processen en representaties op automatisch niveau te bestuderen (Baldwin et al., 1993, 1996; Mikulincer, Gillath, & Shaver, 2002). Desalniettemin is de huidige evidentie met betrekking tot automatische hechtingsprocessen beperkt en zijn vele assumpties van de hechtingstheorie nog niet systematisch getoetst.

De doelstelling van dit onderzoeksproject was om na te gaan in welke mate en op welke manier context en hechtingsstijl gerelateerd zijn aan impliciete representaties en automatische cognitief-motivationele processen. In een eerste reeks studies hebben we ons gericht op het bestuderen van een tot nu toe verwaarloosd aspect van hechtingsfunctioneren, namelijk **selectieve aandacht** voor bedreigende informatie en informatie gerelateerd aan de hechtingsfiguur. Dit is nochtans een cruciaal proces in de activatie en regulatie van het hechtingssysteem omdat het betrokken is in de appraisal en het monitoren van de omgeving en de beschikbaarheid van de hechtingsfiguur (in functie van het detecteren van potentiële bedreiging) (Main, Kaplan, & Cassidy, 1985).

Daarnaast hebben we het proces van nabijheid zoeken bestudeerd als een **automatische actie-tendens** die (automatisch) geactiveerd wordt in een bedreigende context. In het tweede deel van dit onderzoeksproject hebben we ons gericht op het onderzoeken van een aantal schema-inhouden die een cruciale rol spelen in het reguleren en motiveren van cognitie, emotie en gedrag, namelijk **afstand- en nabijheid-doelen** en **zelfrepresentaties**. Beide inhouden werden op automatisch niveau gemeten.

De studies in **hoofdstuk 1 en 2** hebben aangetoond dat angstige en vermijdende hechting geassocieerd zijn met een gelijkaardig aandachtspatroon, namelijk het wegrichten van aandacht van hechtingsgerelateerde bedreigende informatie (hechtingsbedreigende woorden in hoofdstuk 1 en foto's van bedreigende gelaatsuitdrukkingen in hoofdstuk 2). Bovendien bleek dit aandachtseffect het best voorspeld te worden door de combinatie van hoge scores op angst en vermijding. Dit resultaat kan mogelijks verklaard worden door de emotieregulerende functie van aandacht, waarbij het vermijden van bedreigende informatie gezien kan worden als een defensieve respons ten aanzien van informatie die onderliggende angsten activeert (Mogg & Bradley, 1998). We vonden geen evidentie voor de theoretische voorspelling dat hechtingsangst gekenmerkt wordt door een vigilant aandachtspatroon. Om deze assumptie verder te toetsen zal het belangrijk zijn voor toekomstig onderzoek om een onderscheid te maken tussen vroege en late aandachtsprocessen, omdat het mogelijk is dat vigilantie eerder zal optreden op een pre-attentief niveau (vroege detectie van bedreiging).

In **hoofdstuk 3** hebben we vier studies gepresenteerd waarin aangetoond werd dat in een hechtingsgerelateerde bedreigende context (separatie van de hechtingsfiguur) mensen geneigd zijn om hun aandacht te richten naar de hechtingsfiguur. Dit kan gezien worden als een vorm van nabijheid-zoeken op cognitief niveau. Daarnaast konden we aantonen dat dit aandachtseffect sterker uitgesproken was voor angstig gehechte individuen, wat bewijs levert voor hun hyperactief hechtingssysteem (Mikulincer, Pereg, & Shaver, 2003). Er werd echter geen evidentie gevonden voor de assumptie dat vermijdende hechting geassocieerd zou zijn met het vermijden van informatie gerelateerd aan de hechtingsfiguur. Dit resultaat kan mogelijks verklaard worden door het feit dat we gebruik maakten van een hechtingsgerelateerde prime. Eerder werd aangetoond dat vermijdende individuen separatie-gerelateerde gedachten

onderdrukken om aldus activatie van het hechtingssysteem te voorkomen (Fraley & Shaver, 1997; Fraley, Garner & Shaver, 2000). De afwezigheid van een verband tussen vermijdende hechting en selectieve aandacht voor hechtingsstimuli zou dus gedeeltelijk kunnen worden toegeschreven aan het feit dat separatie-bedreiging weinig betekenisvol en dus weinig bedreigend is voor vermijdende individuen.

De studies in **hoofdstuk 4** konden aantonen dat de inductie van een hechtings-gerelateerde (separatie) en een hechtings-ongerelateerde (academisch falen) bedreigende context automatisch een sterkere toenaderingsrepons ten aanzien van de hechtingsfiguur activeert (in vergelijking met een neutrale context). Hechtingsangst bleek geassocieerd te zijn met een sterkere toenaderingsrespons ongeacht de context, wat opnieuw bewijs levert voor hun chronisch- en hyperactief hechtingssysteem. Vermijdende hechting, daarentegen, was geassocieerd met een verminderde toenaderingstendens ten aanzien van de hechtingsfiguur en dit enkel na de inductie van hechtings-ongerelateerde bedreiging. Het is belangrijk om op te merken dat dit de eerste studie is die een verband kon aantonen tussen hechtingsangst en gedragsreponsen, wat suggereert dat onderzoek zich niet alleen moet toespitsen op het bestuderen van reëel (observeerbaar) gedrag, maar ook op de proximale determinanten van gedrag, namelijk automatische actie-tendenzen en doelen.

In **hoofdstuk 5** hebben we drie experimenten gerapporteerd waarin we konden aantonen dat een vermijdende hechtingsstijl geassocieerd is met een sterkere impliciete motivatie voor en positieve evaluatie van inter-persoonlijke afstand binnen de hechtingsrelatie. Belangrijk is dat het verband tussen vermijdende hechting en afstand-gerelateerde doelrepresentaties teruggevonden werd zowel op impliciet als expliciet niveau, en zowel in een bedreigende als neutrale context. Dit toont aan dat het nastreven van afstand bij vermijdende individuen niet enkel gemedieërd wordt door bewuste processen, maar ook gezien moet worden als een automatische motivationele respons. In het geval van angstige hechting kon het verband met nabijheid-doelen enkel teruggevonden worden op expliciet niveau, maar niet wanneer doel-activatie gemeten werd op impliciet niveau. Verder onderzoek is nodig om te bepalen onder welke condities hechtingsangst wel of niet gerelateerd is met nabijheid-zoeken, om zo tot een duidelijker begrip te komen van onze resultaten.

Tenslotte hebben we in **hoofdstuk 6** aangetoond dat hechtingsangst geassocieerd is met een lagere impliciete zelfwaarde en een hogere impliciete angst na het induceren van een hechtingsgerelateerde bedreigende context (separatie). Vermijdende hechting bleek niet geassocieerd te zijn met impliciete relationele zelfrepresentaties. Dit resultaat kan deels toegeschreven worden aan de hechtingsgerelateerde context-prime en het feit dat we zelfwaarde binnen een inter-persoonlijke context gemeten hebben (Carnelley, Israel, & Brennan, 2007).

Algemeen kan worden gesteld dat onze resultaten aantoonden dat de verschillen tussen angstige en vermijdende hechting minder sterk uitgesproken zijn dan verwacht zou worden op basis van de hechtingstheorie. Om deze resultaten in een breder perspectief te plaatsen, hebben we in de algemene discussie van deze doctoraatsthesis een aantal complexiteiten besproken die het onderzoek naar individuele verschillen in hechting bemoeilijken. In eerste instantie hebben we gesuggereerd dat de theorie en het onderzoek naar hechting meer aandacht zou moeten besteden aan de dynamische aard van het hechtingssysteem. Dit impliceert dat, in het maken van predicties over hechtingsverschillen, we rekening moeten houden met het tijdsverloop van het emotieregulatie-proces, het onderscheid tussen impliciete en expliciete processen, de invloed van context, en het samenspel tussen regulatie-processen en doelen op verschillende niveaus van de doelenhiërarchie (zie ook Gross, 1998, 1999, 2002). Op basis van deze dynamische visie op hechting, kunnen we dus stellen dat er zowel verschillen als gelijkenissen kunnen optreden tussen angstige en vermijdende hechting op verschillende punten in het regulatieproces.

Daarnaast dient onderzoek ook rekening te houden met de multi-dimensionele aard van hechtingsstijlen die kunnen verschillen binnen één en dezelfde persoon, afhankelijk van de situationele en relationele context (intra- en inter-persoon variabiliteit). Daarom zal het belangrijk zijn voor toekomstig onderzoek om (de variabiliteit of stabiliteit van) hechtingsrepresentaties en -processen te bestuderen over verschillende situationele contexten en relaties heen.

Als derde complexiteit hebben we de inter-afhankelijkheid van de (maten) van hechtingsangst en -vermijding besproken. Enerzijds doelt dit op de bevinding dat, in bijna al onze studies, de scores op de twee dimensies onderling gerelateerd waren, wat niet strookt met de theoretische assumptie dat angst en vermijding orthogonale dimensies zijn. Anderzijds hebben we benadrukt dat de

vragenlijsten om hechtingsangst en -vermijding (ECR) te meten afgeleid zijn van de theorie en daarom ook vertekend zijn door theoretische predicties. Met andere woorden, we moeten ons ervan bewust zijn dat hechtingsvragenlijsten zoals de ECR slechts één mogelijke bril zijn om naar hechtingsverschillen te kijken en deze bril kan mogelijks een vertekend beeld geven. Daarom zou toekomstig onderzoek meerdere hechtingsstijl-indicatoren moeten opnemen, zoals psycho-fysiologische maten, spontaan gedrag, impliciete maten van hechtingsstijl en vragenlijsten.

Tot slot willen we benadrukken dat dit onderzoeksproject een eerste belangrijke aanzet vormde tot het bestuderen van automatische processen binnen de context van volwassen hechting en dat onze studies een aantal interessante bevindingen opleverden die verder onderzoek naar hechtingsgerelateerde verschillen in aandacht, nabijheid zoeken en (impliciete) schema-inhouden kunnen sturen.