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Current Opinion in Psychology

The psychological effects of the contextual activation of security-enhancing mental representations in adulthood

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According to attachment theory, a sense of attachment security (confidence that others will be responsive and supportive when needed) is a resilience resource in times of need and a building block of mental health and social adjustment. In this article we review what has been learned during the last decade about the causal effects of contextually activating security-enhancing mental representations in adulthood. We begin with a brief account of attachment theory and the cognitive underpinnings of the sense of attachment security. We then review findings from laboratory studies showing that the experimental priming of mental representations of security has positive effects on emotion regulation, appraisals of self and others, mental health, and prosocial behavior.

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Current Opinion in Psychology 2015, **1**:18–21

This review comes from a themed issue on **Relationship science**

Edited by **Eli J Finkel** and **Jeffry A Simpson**

For a complete overview see the Issue and the Editorial

Available online 17th January 2015

http://dx.doi.org/10.1016/j.copsyc.2015.01.008

In his exposition of attachment theory, Bowlby [1–3] emphasized the contribution of mental representations of attachment security to healthy socio-emotional development during childhood and adolescence, and to psychological and social well-being in adulthood. These mental representations allow a person to cope constructively with stressful events, maintain self-esteem and emotional stability, and contribute constructively to mutually satisfying social interactions. In this article we review the extensive research literature on security-sustaining representations and show that momentary activation of these representations are inner resources that contribute to mental health and psychosocial adjustment.

Attachment theory: basic concepts

According to Bowlby [1], human beings are born with an innate psychobiological system (the *attachment behavioral system*) that motivates them to seek proximity to protective others (*attachment figures*) in times of need. Interactions with attachment figures who are responsive and supportive create a core sense of attachment security — a sense based on expectations that key people will be available and supportive in times of need — and result in the formation of positive *working models* (mental representations of self and others). When attachment figures are not supportive, however, a sense of security is not attained and negative working models are formed.

In studies of adolescents and adults, tests of these theoretical ideas have focused on a person's *attachment style* — the systematic pattern of relational expectations, emotions, and behaviors that results from a particular history of interactions with attachment figures [4,5,6•]. These styles can be conceptualized as regions in a continuous two-dimensional space [7,8,9•]. One dimension, attachment *avoidance*, reflects the extent to which a person distrusts others' good will and defensively strives to maintain behavioral and emotional independence. The other dimension, attachment anxiety, reflects the extent to which a person worries that others will not be available in times of need and anxiously seeks for their love and care. People who score relatively low on both dimensions are said to be secure or to have a strong sense of security. Although attachment style is conceptualized as a general orientation to close relationships, it can be considered the top node in a hierarchical network of attachment representations, some of which apply only to certain kinds of relationships and others of which apply only in certain relational contexts [10,11••,12]. These attachment representations can be activated by actual or imagined encounters with supportive or unsupportive others even if they are incongruent with a person's attachment style [13•,14,15]. In this paper, we focus on the psychological effects of the contextual activation of security-enhancing mental representations.

Mental representations of attachment security

According to our model of adult attachment-system functioning [10], mental representations of attachment security include both declarative and procedural knowledge organized around a relational prototype or 'secure-base script' [16]. This script contains something like the following if-then propositions: 'If I encounter an obstacle and/or become distressed, I can approach a significant other for help; he or she is likely to be available and supportive; I will experience relief and comfort as a result of proximity to this person; I can then return to other activities.' There is evidence for the psychological reality of the secure-base script in adulthood [17•].

The secure-base script is built during positive interactions with responsive attachment figures. During these interactions, individuals learn that distress is manageable and external obstacles can be overcome. They also learn about others' responsiveness and goodwill and about their ability to effectively mobilize others' support and manage threats. Moreover, they perceive themselves as valuable, lovable, and special, thanks to being valued, loved, and regarded as special by attachment figures. Adult attachment studies provide extensive evidence that such positive cognitions are characteristic of secure people — that is those scoring lower on anxiety and avoidance scales [18–21]. That is, secure people hold a reservoir of positive cognitions that help them remain relatively stable and calm when coping with stressful events.

These positive cognitions are renewed by the presence of a loving attachment figure. Therefore, even momentary experiences with actual or imaginary supportive attachment figures can activate the secure-base script and improve mental health and interpersonal functioning. In the following section, we review findings from laboratory experiments on the emotional, cognitive, and behavioral effects of secure-base activation.

The psychological effects of security-enhancing mental representations

Attachment researchers have used well-validated experimental techniques to activate mental representations of security (a process known as 'security priming') and have measured their psychological effects. These techniques include presentation of pictures (either explicit/supraliminal or implicit/subliminal) suggesting attachment-figure availability (e.g. a Picasso drawing of a mother cradling an infant in her arms); presentation of the names of actual people designated by participants as security-enhancing attachment figures; guided imagery concerning the supportiveness of an attachment figure; visualization of the faces of security-enhancing attachment figures; and viewing the photograph of an attachment figure. The effects of these primes have been compared statistically with the effects of emotionally positive but attachment-unrelated stimuli or emotionally neutral stimuli.

In the emotional realm, research consistently shows that security priming improves participants' moods, and does so more reliably and powerfully than other positive stimuli (e.g. [22–25]). There is also evidence that security priming has a calming, soothing effect in times of stress. For example, Selcuk *et al.* [26] found that both explicit and implicit forms of security priming speeded up emotional recovery and reduced negative thoughts after recall of an upsetting experience. Other studies have found that viewing a photograph of a romantic partner reduced participants' subjective experience and neural representation of pain in response to heat stimuli [27–29].

In line with these findings, Mikulincer *et al.* [30] reported that security priming mitigates a well-known cognitive manifestation of post-traumatic responses — longer reaction times when naming the colors in which trauma-related words are printed [31]. Israeli undergraduates who reported high or low levels of Post-Traumatic Stress Disorder (PTSD) symptoms related to terrorist attacks performed a Stroop color-naming task that included, among other words, 10 terror-related words. During this task they were subliminally primed with an attachment-security word, a positive attachment-unrelated word, or a neutral word. Overall, PTSD symptoms were associated with longer color-naming latencies for terror-related words, indicating greater mental accessibility of the words. However, this association was nullified by security priming. That is, momentary activation of security representations had a soothing effect, lowering the accessibility of trauma-related thoughts during the Stroop task. This effect was replicated in a longitudinal study of Israeli ex-prisoners of war from the 1973 Yom Kippur War [32••].

Attachment researchers have also found that security priming has beneficial effects on self-esteem, expectations of a partner's behavior [33–35]. Rowe and Carnelley [34], for example, found that participants in a security priming condition (writing about a past relationship in which they felt secure) reported more positive expectations for their current relationship than those who were primed with insecure representations. Pierce and Lydon [33] found that exposure to security-related words (as compared to neutral words) increased reliance on support seeking as a way of coping with stress.

There is also evidence that security priming facilitates confident engagement in attachment-unrelated activities, such as creative problem solving or caring for a needy other. For example, subliminal priming with security-related words priming led to better performance in a creative problem-solving task (the Remote Associates Test) than subliminal priming with neutral words [36]. In addition, subliminal priming with names of security providers, as compared with neutral priming, increased empathic concern for a suffering stranger and endorsement of prosocial values (concern for close others and for all humanity) [23,24] and prevented burnout and compassion fatigue among volunteers working with traumatized people [37•].

In another study, security priming has been also found to affect the decision to help or not help a person in distress [38]. Participants were subliminally primed with either the name of a security provider or a neutral name and then watched a confederate while she performed a series of aversive tasks. As the study progressed, the confederate became increasingly distressed, and the participant was given an opportunity to take her place, in effect sacrificing self for the welfare of another. Findings indicated that