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Priming the Secure Attachment Schema: Effects on Emotion Information Processing

Panoraia Andriopoulos

Psychology Department, Southampton Solent University, UK

Konstantinos Kafetsios

Psychology Department, University of Crete, Greece

Abstract

The present study examined the effects of secure schema activation on selective attention towards attachment-related and emotional information. Seventy two participants were randomly allocated into two conditions–subliminal priming of mental representations of supportive attachment figures (a Picasso sketch of a mother holding a baby and looking into his eyes) and a no priming condition followed by an administration of a dot probe task that included positive and negative attachment-related and emotion words. The results showed that the activation of the secure prime in conjunction with chronic attachment orientations affected the processing of positive and negative attachment-unrelated emotional information. Results highlight relationships between higher-order processes of the attachment system (attachment schema activation) with early stage information processing (selective attention) as assessed by the dot probe task. Methodological issues are discussed with reference to the priming method used and the traditional version of the dot-probe task.

Keywords: adult attachment organization, information processing, security priming

Priming of the Secure Attachment Schema: Effects on Information Processing

Over the last fifteen years attachment research has focused on how insecure attachment orientations (avoidance and anxiety) influence the processing of attachment and related emotion information (for a review see Dykas & Cassidy, 2011). This line of research has centred mostly around possible relationships between insecure attachment orientations and cognitive processes such as attention

✉ Konstantinos Kafetsios, Psychology Department, University of Crete, Gallos Campus, Rehtymno, Crete 74100, Greece. E-mail: *kafetsik@uoc.gr*.

and information retrieval. Yet, research on the protective mechanisms surrounding the attachment working model is limited. If one is to draw conclusions regarding the consequences of attachment organization and information processing, it is important to understand secure individuals' protective mechanisms. The present study therefore examined how the activation of the secure schema affects selective attention towards attachment-related and/or broader emotional information.

The Secure Base Schema

The *secure base* constitutes one of the basic notions of Bowlby's attachment theory (Bowlby, 1973). According to this concept, interactions with an available and responsive attachment figure early in life result in the formation of a secure base, especially in stressful situations. The infant experiences a *sense of security* (Sroufe & Waters, 1977) – a sense that the world is safe and the attachment figures are available in times of need – and consequently the infant is able to explore the environment with curiosity and confidence (Mikulincer & Shaver, 2007a). Bowlby theorised that the positive interactions with an attachment figure are internalised as secure working models concerning the self and others. These working models involve both declarative knowledge (the self is special and valued and deserves beneficial care from relationship partners, Mikulincer & Shaver, 2004) and procedural knowledge about distress management which becomes organized around a relational secure-base script (Mikulincer & Shaver, 2007b). The secure script consists of conditional propositions such as: "If I encounter an obstacle and/or I become distressed, I can approach a relationship partner for help". When this script is activated it serves as a guide regulating adaptively both cognitive and emotional processes responsible for coping with distress and overall negative feelings (Mikulincer, Shaver, Sapir-Lavid, & Avihoo-Kanza, 2009).

Over the last decades a number of studies have examined correlates of the secure base schema in adult life (Mikulincer & Shaver, 2001). These studies, have been mostly based on self-report measures of adult attachment, and have provided evidence in support of Bowlby's (1969) claims concerning the beneficial effects of secure attachment (e.g., Mikulincer & Shaver, 2001). For example, in comparison to their insecure counterparts, secure individuals experience lower levels of physical arousal under stressful situations (Mikulincer & Florian, 1998), seek proximity as a strategy to combat distress (Fraley & Shaver, 1998), have more positive expectations from their partners and interpret their behaviour more positively (Collins, 1996), have a more positive self-image (Bartholomew & Horrowitz, 1991), and have more flexible cognitive structures that can easily encompass new information (Mikulincer, 1997). When faced with situations that trigger negative feelings, secure individuals employ functional coping strategies such as problem solving, planning and reattribution; they attempt to put negative events into a more realistic perspective and mobilise support from people with extra

resources. Additionally, secure adults maintain self-soothing abilities and can focus their attention on more constructive alternatives instead of ruminating and catastrophizing (Mikulincer & Shaver, 2007a).

Activation of the Secure Base Schema

Even though the sense of a secure base is formed in infancy through interactions with the primary attachment figures, Bowlby (1988) believed that also interactions with a significant other in adulthood can influence a person's beliefs regarding the availability, responsiveness, and support from others (Mikulincer & Shaver, 2001). In that sense, working models integrate influences from attachment figures other than the primary ones (e.g., romantic partners). Such influences can be considered as distinct representational models that are different from the dispositional (or global) attachment orientations (Gillath, Selcuk, & Shaver, 2008). Moreover, secure and insecure attachment schemas can "co-exist" as persons can hold secure and insecure mental representations at the same time (Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996; Rowe & Carnelley, 2003, 2005).

The cognitive activation of the secure base schema can lead insecure individuals to behave in a manner similar to that of their dispositionally secure counterparts. For example, exposing individuals to the name of a supportive person led to more frequent positive self-evaluations (Baldwin, 1994). Cognitive activation with proximity-related words increased the pursuit of support and decreased the self-depreciation when faced with a stressful situation and these effects concerned both anxious and avoidant participants (Pierce & Lydon, 1998). In a series of studies Mikulincer, Shaver, and colleagues (e.g., Mikulincer, Hirschberger, Nachmias, & Gillath, 2001; Mikulincer & Shaver, 2001) examined the consequences of activating mental representations of supportive attachment figures through a number of techniques (e.g., subliminal presentation of attachment figure availability using a Picasso sketch of a mother holding a baby and looking into his eyes; subliminal presentation of attachment figures' names; guided imagery involving the availability and support from an attachment figure; and visualisation of attachment figures' faces).

These studies showed that subliminal activation of the secure schema had positive effects on reactions to others' needs (Mikulincer, Gillath et al., 2001), reactions to outgroups (Mikulincer & Shaver, 2001), the willingness to self-disclose and seek support (Gillath et al., 2006) and finally, on the mental accessibility of attachment-related goal words (Gillath et al., 2006). In a more recent series of experiments that were carried out in Israel and the US (Mikulincer, Shaver, Gillath, & Nitzberg, 2005) priming attachment security led participants to greater compassion and willingness to help a person in distress even when there was no egoistic reason (empathic joy, no mood relief) for helping. More recent studies

have revealed that experimentally boosting attachment security is related to enhanced creative problem solving (Mikulincer, Shaver, & Rom, 2011), increased authenticity, a reduced tendency to lie or cheat (Gillath, Sesko, Shaver, & Chun, 2010) and a reduced tendency to regret for current or past close relationships (Schoemann, Gillath, & Sesko, 2012). Finally, a study by Carnelley and Rowe (2007) investigated whether repeated priming of attachment security had more lasting effects on views of self and relationships. In line with the researchers' hypotheses, participants in the security prime condition reported more positive relationship expectations, more positive self-views and less attachment anxiety. These findings indicate that the repeated priming of security can have long-lasting effects.

The Secure Base Schema and the Processing of Emotional Information

As discussed above, there is robust evidence for the consequences of secure base schema activation for individual and relational well-being. Yet researchers have not examined the effects of activating secure attachment on information processing. This is a curious neglect, given also increased attention in the effects of adult attachment on the processing of emotional and attachment-related information (e.g., Dewitte, De Houwer, Koster, & Buysse, 2007; Dewitte, Koster, De Houwer, & Buysse, 2007; Mikulincer, Gillath, & Shaver, 2002; Zeijlmans Van Emmichoven, van Ijzendoorn, de Ruiter, & Brosschot, 2003). This line of research has mostly focused on the possible effects chronic insecure working models can have on cognitive processes such as attention and information retrieval of attachment-related information (Edelstein, 2006; Fraley, Garner, & Shaver, 2000).

Attention mechanisms are considered vital for attachment-related differences in the processing of potentially threatening stimuli (Fraley et al., 2000). Research that has used the Emotional Stroop task revealed less interference–suggestive of attentional biases–for positive and negative attachment-related words for avoidant individuals (e.g., Edelstein & Gillath, 2008; Mikulincer, Dolev, & Shaver, 2004) and a tendency of anxious individuals to attend to separation words (Mikulincer et al., 2004). Another study employing the Dot Probe Task (Dewitte, Koster et al., 2007) revealed that both anxious and avoidant individuals turned their attention away from attachment threat words, and in fact this attentional avoidance was best predicted by the interaction between attachment anxiety and avoidance. Notably, there were also reported null-results in a study that examined interference effects for general threat words in the Stroop task as a function of individual differences in adult attachment (Zeijlmans Van Emmichoven et al., 2003). Taken together, these findings on the relationship between chronic attachment orientations and information processing demonstrate a certain level of ambiguity on the extent to which chronic security relates to attention biases towards attachment-related and general emotion information.

To the best of our knowledge there is limited research on how activating attachment security influences attachment-related and emotional information. On the basis of the available evidence one would expect that secure adults, who are characterized by low levels of attachment anxiety and low levels of attachment avoidance, tend to avoid the processing of threatening information. It is equally possible, however, that secure adults can turn their attention towards this kind of information since they are considered to be cognitively "open" even to information that does not align with their motives. Along these lines, it has been shown that secure individuals recognise their feelings accurately, they experience emotions without distortions, and they can communicate them to other people without hesitation since they expect others to respond in a positive way (Mikulincer & Shaver, 2007a). According to Cassidy (1994), the experience of security does not depend on the disavowal or avoidance of negative emotions but rather on the ability to endure them with the final aim to acquire new skills in dealing with threatening situations. Additionally, Zeijlmans Van Emmichoven et al. (2003) found that clinically anxious patients who were securely attached showed greater interference for threatening words in an Emotional Stroop task compared to their insecure counterparts who appeared to ignore or avoid such words. In the light of these findings the researchers concluded that securely-attached patients are more "open" to the processing of threatening information compared to insecurely-attached patients. Finally, it is also plausible that secure persons show no attentional bias whatsoever (see Dewitte, Koster et al., 2007). Therefore, securely-attached individuals may not focus their attention on threatening attachment-related information.

The Present Study

The information processing patterns of insecure attachment are inextricably linked to emotion regulatory processes and psychological adjustment. Consequently, it is important to explore the effects of secure attachment priming on stages of information processing, attention in particular.

The present study aimed to examine the effects of subliminally primed attachment security on attending to emotional and attachment-related information, and explore the possible interaction of this activation with chronic attachment orientations. We utilized a dot-probe task, which is a more reliable assessment of attention biases (MacLeod, Mathews, & Tata, 1986), and included both attachment-related and positive and negative (general) emotion stimuli given recent evidence that security priming leads participants to use more positive and less negative emotional words. Moreover, securely primed individuals used more attachment secure words than anxiously primed individuals (Carnelley & Rowe, 2010). These findings suggest that the cognitive activation of security may also activate cognitive structures responsible for positive emotional words and positive attachment-related

words (through spreading activation; Collins & Loftus, 1975). Therefore, we expected that the activation of security will affect the processing of positive attachment and general emotion information through spreading activation (Bower, 1981).

More specifically, taking also into account key associative theories of emotion and recent related evidence (Carnelley & Rowe, 2010) we predicted that individuals in the subliminal security priming condition will turn their attention towards positive attachment-related and emotional words, and away from negative attachment-related and emotional words. However, based on the fact that secure individuals are cognitively "open" even to information unrelated to their goals and motives (Mikulincer & Shaver, 2007a) we could also expect that the activation of security will lead to attentional biases towards negative emotional and attachment-related words.

Finally, the research aimed to explore the interaction between chronic and temporarily activated security orientations. In a review of the literature Gillath and colleagues (2008) suggested that security priming has beneficial effects on most study participants regardless of their dispositional attachment orientation. However, there are few studies showing that chronic attachment insecurities moderate the effects of experimentally induced security (e.g., Cassidy, Shaver, Mikulincer, & Lavy, 2009; Schoemann et al., 2012). Given the limited and conflicting available information, we had no specific expectations regarding possible interactions between chronic and temporarily activated security.

Method

Participants

Seventy-two students (35 females and 36 males; age M=20.07, SD=2.68) at a large Greek state University participated in the study. Students were enrolled in different courses (speech therapy, nursing, social work), were recruited in class and received credit for their participation.

Instruments

Global attachment orientation was measured using the *Greek version of the Experiences in Close Relationships Questionnaire revised version* (ECR-R; Tsagarakis, Kafetsios, & Stalikas, 2007). According to this model, security corresponds to low scores on the avoidance and anxiety dimensions. Alphas for the avoidance and anxiety dimensions were .85 and .89, respectively. The two dimensions were significantly correlated (r=.44, p<.01).

Participants also completed the *Positive and Negative Affectivity Schedule* (PANAS-brief scales; Watson, Clark, & Tellegen, 1988). Cronbach's α for the positive affect scale was .85 and for the negative affect scale was .86. They also completed the *State Anxiety Inventory* (Spielberger, Girsuch, & Lushene, 1970) which had a Cronbach's α=.92.

In the *Dot probe task* (MacLeod et al., 1986), two stimuli, a critical and a neutral stimulus are presented simultaneously at two different spatial locations of the computer screen. In the "critical" trials, one word from each pair is either emotional or attachment-relevant, whereas the other one is neutral. Each pair of words is presented very shortly and when the words disappeared and dot appeared at the location of one of the words. Responding to trials where a probe is presented at the same location as the critical word ("congruent" trial) is compared with responding to trials where a probe is presented at the same location as the non-critical word ("incongruent" trial).

The task begun with a cross at the center of the screen for 1000 ms in order to make sure that participants' attention was turned to the right location. Subsequently, an arrow of #### was presented for 500 ms followed by a subliminal (16.6 ms) presentation of the Picasso's mother-child picture. The control group was not exposed to such a presentation. After the presentation of the *prime* another arrow of #### was presented for 500 ms. The words were presented at a distance of 5 cm above and 5 cm below the center of the screen. When the pairs of words disappeared from the screen a dot with a diameter of 10 mm was presented in the location of one of the words and remained there until the participant responded. Participants had to indicate the correct location of the dot (the right click of the mouse indicated the upper location, whereas the left indicated the bottom location). The time between the two trials was 2533 ms in the subliminal group, and 2000 ms in the control group. The stimuli for the dot probe task consisted of five word categories: 10 positive attachment related words, 10 negative attachment related words, 10 positive emotional words, 10 negative emotional words, and 40 neutral words (see Appendix 1). Another set of 40 neutral words was used to create a set of 20 neutral pairs.

The words, as well as the dot, appeared as frequently at the upper part of the screen as at the bottom part and the dot replaced the "critical" or the neutral word equally often. Thus, 240 trials were generated and presented in random order. Before the experimental trials, participants were provided with ten trials of neutral words which were not included in the main experiment. Importantly, the neutral words were matched to the "critical" words in terms of word length and frequency of usage in the Greek language (as appeared in the Hellenic National Corpus of the Greek Institute for Language and Speech Processing). Cronbach's alphas for the words in the dot probe task were: positive attachment words α=.96, negative attachment words α=.95, positive emotion words α=.96, and negative emotion

words α=.97.The dot probe task was programmed on DMDX experiment software (Forster & Forster, 2003).

Procedure

The study was completed in two phases, more than a week apart from one another, in the spring of 2010. In the first phase participants completed a battery of questionnaires including the ECR-R. In the second part of the study participants were randomly allocated in one of the two groups (subliminal priming, or control). Prior to the experiment, mood was assessed with the PANAS (Watson et al., 1988). All participants were individually tested on a PC with an SVGA 15 inch color monitor. They were informed that they would perform a dot detection task, and that they should respond to the dot as quickly as possible. They were then administered a practice trial of ten items in order to familiarise with the task and the test trial begun.

Results

Latencies with errors were removed as well as reaction times greater than 2000 ms or shorter than 200 ms, which were considered as outliers. Additionally, reaction times that were three standard deviations above or below the mean of each trial were also excluded from statistical analyses (the total percentage of trials removed was less than 2%).

The Effect of Word Type and Congruency

A 4 (emotion positive, emotion negative, attachment positive, attachment negative) X 2 (congruent, incongruent) repeated measures analysis of variance was conducted. The analysis revealed no significant main effect or interaction, suggesting that participants did not preferentially allocate their attention to a specific word category (see Table 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*

Trial type	Congruency	*M*	*SD*
Emotion Positive	Congruent	610.92	141.14
	Incongruent	606.62	145.92
Emotion Negative	Congruent	607.93	141.62
	Incongruent	603.07	150.09
Attachment Positive	Congruent	615.50	153.21
	Incongruent	620.72	143.98
Attachment Negative	Congruent	613.85	151.51
	Incongruent	608.46	142.55

Attachment Orientations and Priming Effects

To investigate the relationship between attachment avoidance and anxiety (both low/high, using median split procedures) and selective attention, an index of attention was calculated. For each word type, vigilance–avoidance scores were calculated by subtracting the average detection time on congruent trials from the average detection time on incongruent trials (Dewitte, Koster et al., 2007; Mogg, Millar, & Bradley, 2000). A positive value for this index indicates vigilance (faster reaction times to probes following attachment or emotionally relevant words compared to probes following neutral words), zero indicates no attentional bias, and a negative score indicates avoidance (slower reaction times to probes following attachment or emotionally relevant words compared to probes following neutral words).

In order to assess the influence of attachment orientations and priming method on attention, a series of 2 (priming group: subliminal/control), by 2 (anxiety: low/high), by 2 (avoidance: low/high) ANOVAs were conducted for each word category (emotion positive, emotion negative, attachment positive and attachment negative).

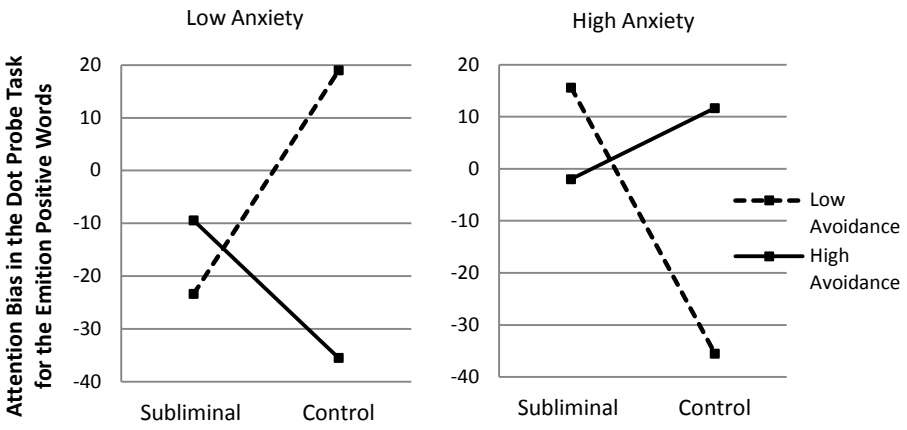
Results from these analyses revealed no significant main effects or interactions regarding attachment negative or attachment positive word stimuli (see Table 2). However, for the *emotion positive words* there was a significant interaction among group, anxiety, and avoidance $F(1,64)=9.58$, $p<.05$, $\eta_p^2=0.86$. This interaction remained significant even after controlling for positive and negative affect (as well as relationship status and duration, life satisfaction, state anxiety). Simple Effects analyses revealed that low anxious/low avoidant (secure) participants in the priming condition ($M=-23.38$, $SD=35.13$) turned their attention away from the emotion positive words in comparison with low anxious/low avoidant participants in the control condition ($M=18.97$, $SD=45.72$), $p<.05$. In addition, high anxious/low avoidant (anxious) participants in the priming condition turned their attention towards the emotion positive words ($M=15.59$, $SD=41.76$) compared to high anxious/low avoidant participants in the control condition ($M=-35.50$, $SD=43.49$), $p<.05$ (see Table 2 and Figure 1).

Table 2. *Means and Standard Deviations (in Parentheses) of the Vigilance-Avoidance Index (Attention Bias) of the Dot Probe Task as a Function of the Interaction Among Group, Avoidance and Anxiety*

Type of words		*Att. Negative*				*Att. Positive*				*Em. Negative*				*Em. Positive*			
Avoidance		*Low*		*High*		*Low*		*High*		*Low*		*High*		*Low*		*High*	
Anxiety		*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*
Subliminal	*M*	1.96	4.44	1.58	-1.00	-17.11	24.98	-16.35	-3.96	-7.19	-28.64	6.08	3.69	-23.38	15.60	-9.46	-1.99
	SD	37.88	26.40	26.22	51.82	52.02	44.52	32.14	53.52	35.44	36.43	14.01	49.89	35.13	41.76	26.46	42.59
Control	*M*	-13.18	10.18	5.67	-37.71	22.07	6.73	5.47	16.19	-18.54^{ac}	7.71	25.41^{b}	-19.12^{c}	18.97^{a}	-35.51^{bc}	-29.19^{c}	11.66^{abd}
	SD	45.53	32.89	57.85	75.45	30.64	52.34	37.45	81.16	36.00	36.41	23.26	47.80	45.72	43.49	24.51	45.31

Note. Means with differing letters in their subscripts within different word types are significantly different (when the same letter appears in two or more subscripts, then the means do not differ significantly)

Figure 1. *Attentional Biases in the Dot Probe Task as a Function of Low Attachment Anxiety (a) or High Attachment Anxiety (b), Avoidance and Priming Condition for the Emotion Positive Words*



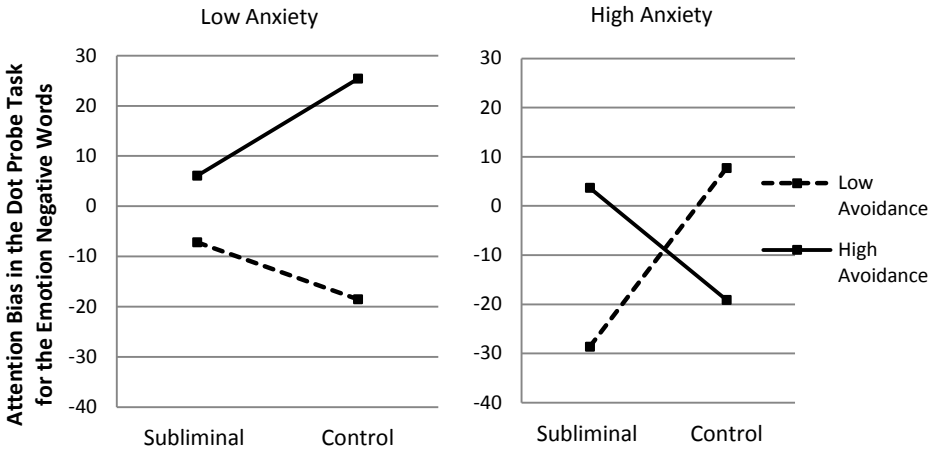
There were also differences within the groups. Thus, low anxious/low avoidant participants (*M*=-23.38, *SD*=35.13) in the subliminal group turned their attention away from the emotion positive words compared to low avoidant/high anxious adults (*M*=15.59, *SD*=41.76), $p<.05$ in the same condition. In the control group, low anxious/low avoidant participants (*M*=18.97, *SD*=45.72) turned their attention towards emotion positive words in comparison with high anxious/low avoidant participants (*M*=-35.51, *SD*=43.49) and low anxious/high avoidant (avoidant) participants (*M*=-29.19, *SD*=24.51), $p<.05$ and $p<.01$ respectively. Finally, high anxious/high avoidant adults (fearful) (*M*=11.67, *SD*=45.31) turned their attention towards emotion positive words compared to low anxious/high avoidant participants (*M*=-29.19, *SD*=24.51), $p<.05$ and high anxious/low avoidant participants (*M*=-35.51, *SD*=43.49), $p<.05$.

Another three way ANOVA, concerning the *emotion negative words*, revealed a significant interaction among priming group, anxiety and avoidance $F(1,64)=5.03$, $p<.05$, $\eta_p^2=0.60$. This interaction remained significant even when relationship status, relationship duration, life satisfaction, state anxiety and affectivity prior to the experiment (positive and negative) were used as covariates. There were no significant differences between the two experimental conditions, but there were differences within the groups.

Simple Effects analyses revealed that high avoidant/low anxious individuals in the control group (*M*=25.41, *SD*=23.26) responded significantly faster to (turned their attention towards) the *emotion negative* words than high avoidant/high anxious individuals in the same group (*M*=-19.12, *SD*=47.80), $p<.05$. Moreover,

high avoidant/low anxious participants in the control group (*M*=25.41, *SD*=23.26) responded significantly faster to the *emotion negative* words than low avoidant/low anxious participants in the same group (*M*=-18.54, *SD*=36.00), $p<.05$ (see Table 2 and Figure 2).

Figure 2. *Attentional Biases in the Dot Probe Task as a Function of Low Attachment Anxiety (a) or High Attachment Anxiety (b), Avoidance and Priming Condition for the Emotion Negative Words*



Discussion

The current study investigated the effects of secure attachment activation on the processing (allocation of attention) of attachment-related and general emotional information. The results showed that priming attachment security interacted with chronic attachment orientations to affect the processing of positive (attachment-unrelated) information. Specifically, it was found that participants with chronic secure attachment in the subliminal security priming condition turned their attention away from positive emotional words compared to secure individuals in the control condition (had slower reaction times to probes following emotion positive words compared to probes following neutral words). Interestingly, participants higher in chronic anxiety in the secure priming condition turned their attention towards positive emotional words.

Notably, the patterns of information processing for the secure and anxious individuals were reversed depending on the experimental condition. Thus, when security was activated, dispositionally secure adults turned their attention away from emotional positive information while anxious adults turned their attention

towards such information, whereas in the control condition secure individuals turned their attention towards emotional positive information whereas anxious individuals turn their attention away from such information. Surprisingly, there were no findings concerning attachment-related positive or negative words. These findings cannot be attributed to participants' mood or anxiety, since positive and negative affect and state anxiety were controlled.

The results suggest that priming the secure attachment schema has implications for the processing of general emotion information in line with related research (Carnelley & Rowe, 2010) and key associative network theories (Bower, 1981). Importantly, the results demonstrated an interaction between chronic and temporary activated attachment orientation on information processing. In a review of the literature on repeated secure priming Gillath and colleagues (2008) express their reservations as to whether the effects of attachment priming are independent of dispositional attachment insecurities; this suggestion is based on a study (Mikulincer et al., 2002) that showed a clear interaction between dispositional attachment style and the subliminal activation of the attachment system (realized with the word "abandonment"). Accordingly, there are recent studies depicting interactions between dispositional attachment style and experimentally induced security which affect the way individuals deal with painful emotions (Cassidy et al., 2009) and feelings of regret associated with past mistakes (Schoemann et al., 2012).

Interestingly, there was no evidence of security priming influence on information processing irrespective of dispositional attachment anxiety and avoidance, as expected. This part of the findings were not in line with our hypotheses suggesting that the subliminal activation of attachment security may deliver the beneficial effects on emotional and attachment-related information processing regardless of variations in chronic attachment insecurities. Given that the emotion regulatory consequences of raising security activation (e.g., Shaver, Mikulincer, Lavy, & Cassidy, 2009) are attained mostly through cognitive processes we could expect that priming the secure base schema should have effects on emotional information processing. However, this was not the case. It is possible that the priming method employed in this study (subliminal activation) may not have been salient enough to fully activate attachment security. Subliminal activation has been questioned on methodological grounds (Mayer & Merckelbach, 1999). Yet, several studies have employed this method successfully (see Mikulincer & Shaver, 2007b). Future studies can use manipulation checks, such as physiological measures (e.g., skin conductance, heart rate etc.) or self-report measures to ensure that the subliminal presentation of a painting depicting attachment security activates effectively the secure base schema. Additionally, future research could employ supraliminal priming methods.

In the present study we found interactions between secure priming and insecure orientations but these interactions were evident only for the emotional

words. This part of the unexpected findings of the current study could be associated with the traditional version of the dot probe task that assesses only one snapshot of attention meaning where attention is allocated when the dot appears. This manipulation allows no insight into whether attention is allocated before or after the measured snapshot (Cooper & Langton, 2006). Based on this line of reasoning it is quite possible that the effects of attachment style on attention are evident at different time-frames depending on both attachment style and type of stimuli (e.g., it is possible that biases for positive words appear at different time-frames than biases for negative words). Cooper and Langton (2006) studied selective attention towards threatening words in the general population and revealed that the initial deployment of attention occurs much earlier than 500 ms and that at 100 ms the pattern of deployment of attention is in fact the opposite of that observed at 500 ms. It becomes obvious then that future research should examine attentional biases at different presentation times (e.g., 100, 500, 1000, 1500 ms) in order to reveal the timeline of these biases.

In conclusion, the present study attempted to investigate the effects of attachment security activation on information processing of attachment and general emotion stimuli. We did not evidence a direct effect of secure priming on allocation of attention, but this effect was moderated by participants' chronic attachment orientations. The results highlight the beneficial effects security priming can have for chronically insecure persons. Theoretically, the results are also in keeping with recent studies (e.g., Kafetsios, Andriopoulos, & Papahiou, 2014) that highlight the dynamic nature of attachment organization as far as emotion information processing is concerned.

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Primado en el esquema del apego seguro: Efectos sobre procesamiento de informaciones emocionales

Resumen

Este estudio investiga los efectos de la activación del esquema seguro sobre la atención selectiva con respecto al apego e informaciones emocionales. Setenta y dos participantes fueron repartidos al azar en dos condiciones – primado subliminal de las representaciones mentales de figuras de apego que servían de apoyo (el dibujo de Picasso de la madre con el niño en los brazos y mirándole a los ojos) y una condición no primada y seguida por la aplicación de *dot probe task* que incluía palabras emocionales y aquellas positivas y negativas relacionadas con el apego. Los resultados han mostrado que la activación del primado seguro junto con las orientaciones del apego crónico afectó al procesamiento de la información emocional positiva y negativa que no estaba relacionada con el apego. Los resultados destacan la relación entre el proceso de nivel más alto del sistema de apego (activación del esquema de apego) con la etapa temprana del procesamiento de informaciones (atención selectiva), como ha sido comprobado por *dot probe task*. Los problemas metodológicos se discuten respecto al método de primado usado y las versiones tradicionales de *dot probe task*.

Palabras claves: organización del apego en adultos, procesamiento de informaciones, primado seguro

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Appendix 1. *The Stimuli for the Dot Probe Task*

Attachment Negative Words	Attachment Positive Words	Emotion Negative Words	Emotion Positive Words
Ignorance	Love	Anxiety	Rejoice
Indifference	Hug	Threat	Optimism
Unresponsiveness	Honesty	Despair	Serenity
Depreciation	Trust	Aversion	Enthusiasm
Rejection	Caress	Illness	Success
Divorce	Interest	Death	Cheerful
Loneliness	Mother	Sorrow	Contentment
Contempt	Affection	Misadventure	Calmness
Betrayal	Partner	Disaster	Philanthropy
Separation	Care	Danger	Enjoy