Eating me up inside: Priming attachment security and anxiety and their effects on snacking

Running Head: Priming attachment security and anxiety and snacking

Abstract

Recent research has shown that attachment anxiety (a model of interpersonal relationships characterised by a fear of abandonment) is a good predictor of disinhibited eating and, in turn, body mass index (BMI). However, this association has yet to be explored *within* an eating episode. The present study investigated the effect of priming attachment security and attachment anxiety on food intake. Normal weight participants (N = 21) were primed with security and anxiety on separate occasions and given *ad libitum* access to a snack food. Priming anxiety led to a significantly higher food intake than priming security (p = .016). We suggest that participants consumed more food in response to the anxious prime in an attempt to manage the resulting feelings of insecurity. These results provide behavioural evidence for a link between attachment anxiety and disinhibited eating.

Keywords

Attachment anxiety; Security priming; Disinhibited eating; Affect regulation

"Dispositional attachment orientation" is the general cognitive representation of the self and others within relationships that is usually abstracted from early experiences with a caregiver (Bowlby, 1969). Recently, in a sample of 200 male and female participants (age range from 17 - 60 years old), dispositional attachment orientation was identified as a predictor of body mass index (BMI) (Wilkinson, Rowe, Bishop, & Brunstrom, 2010). Specifically, attachment anxiety (a fear of abandonment), but not attachment avoidance (a distrust of intimacy) (Collins & Read, 1994), was positively related to BMI.

"Disinhibited eating" is measured as a trait using the Three Factor Eating Questionnaire (TFEQ; Stunkard & Messick, 1985) and assesses a general propensity to over-eat (for a review see Bryant, King, & Blundell, 2008). Importantly, disinhibited eating was found to fully mediate the relationship between attachment anxiety and BMI described above (Wilkinson et al., 2010). This finding is consistent with a questionnaire-based study which showed that pre-adolescent boys and girls who reported experiencing loss of control over eating tended to have attachment orientations (toward both parents) which were more insecure than those who did not report loss of control over eating (Goossens, Braet, Bosmans, & Decaluwé, 2011). In addition, this research is in line with previous research assessing the relationship between other "disinhibited" behaviours (*e.g.,* alcohol consumption, substance abuse and sexual promiscuity) and attachment orientation (Brennan & Shaver, 1995; Brook, Whiteman, Finch, & Cohen, 1998; Defronzo & Pawlak, 1993).

The relationship between attachment orientation and disinhibited behaviours is often understood in terms of affect/ emotion regulation (for a review see Maunder & Hunter, 2001). Generally, attachment theory offers a framework to understand the strategies used by individuals to cope with stress (Kobak, Holland, Ferenz-Gillies, Fleming, & Gamble, 1993; Mikulincer, Florian, & Tolmacz, 1990). An individual's affect regulation strategy depends on

their attachment orientation (for a review see Mikulincer, 1998). When distressed, securely attached individuals seek proximity to or activate symbolic representations of an attachment figure in order to self-sooth. They acknowledge, but are not overwhelmed, by distressing cues in the environment (Mikulincer & Florian, 1998). In so doing, securely attached individuals are successfully utilizing *internal* emotion regulation strategies and protecting themselves from distressing cues in the environment.

By contrast, individuals that are high in avoidant attachment respond to distress by detaching themselves from its source (Bowlby, 1988). This can mean distancing themselves from distressing cues in the environment or suppressing any internal thoughts which might cause distress (Mikulincer & Orbach, 1995). The attachment system is de-activated. Thus, avoidant individuals do not acknowledge distress in the first place and therefore there is no emotional response to manage.

Individuals high in anxious attachment are relatively poor at managing their emotions in response to distress. Indeed, studies have shown that when they experience distress, a response pattern that exacerbates this stress occurs. The attachment system is hyper-activated as they seek a secure-base attachment figure and as a result they become hyper-vigilant to distressing cues in their environment (Mikulincer & Florian, 1998). In these circumstances, an *external* source of comfort such as alcohol, food or cigarettes can soothe, distract or excite without aggravating the cycle of distress described (Maunder & Hunter, 2001).

However, over time, the use of external affect regulators such as those mentioned can have adverse health consequences (Maunder & Hunter, 2001). In the case of disinhibited eating, the health consequence is to have a BMI which is viewed as overweight/ obese (>25/ >30 respectively; World Health Organization, 2011). Therefore, it is crucial to explore

opportunities for behavioural intervention which target the fundamental attachment systems as opposed to an approach which merely manages the resulting unhealthy behavior.

Dispositional attachment orientation is a cognitive representation abstracted from early relationships that has been repeatedly activated by naturally occurring events and become chronically accessible (Collins & Read, 1994). However, by adulthood we also possess representations resulting from our other well-rehearsed attachment relationships (such as with long-term romantic partners) (Baldwin, 1992; Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996; La Guardia, Ryan, Couchman, & Deci, 2000). Importantly, these separate representations of relationships may not match our dispositional attachment orientation; whilst our dispositional attachment orientation may be anxious, we may also possess another attachment representation that is secure (Baldwin et al., 1996). Indeed while most attachment relationships in the attachment networks of healthy individuals are secure, most individuals hold representations of anxious and avoidant orientations (Baldwin et al., 1996; Rowe & Carnelley, 2003, 2005).

These "relationship-specific attachment orientations" can be activated and made acutely accessible. This can happen naturally during everyday life personal interactions or artificially in the laboratory using semantic priming tasks (for a review see Carnelley & Rowe, 2010). Notably, "security priming" (low attachment anxiety and avoidance) has been associated with positive feelings and attitudes (Carnelley & Rowe, 2010) as well as numerous pro-social personal and interpersonal behaviours (Mikulincer & Shaver, 2007). Therefore, as long as an individual possesses a representation which is secure (or anxiety/ avoidance) then security priming (or anxiety/ avoidance priming) can take place.

Considering the theoretical link between attachment orientation and affect regulation and the specific studies reporting a link between attachment anxiety and the use of external

affect regulators (discussed above), the current study investigated whether priming might be a process which can be utilised to manipulate the amount consumed during a snacking episode. We hypothesized that priming attachment anxiety (through the adverse effects of the hyper-activation of the attachment system) would result in more snack food consumption than priming attachment security (through its protective effects under situations of distress). Notably, we suggest that in response to the effects of de-activation (rather than a protective effect in response to distress), priming attachment avoidance would result in a similar pattern of consumption as the secure prime condition. It is for this theoretical reason, supported by a lack of reported relationship between attachment avoidance and disinhibited eating (Wilkinson et al., 2010), that no avoidance priming condition was included in this study.

Method

Participants. Twenty-one female participants (Mean age = 21.19 years, *SD* = 3.12; Mean BMI = 21.41 kg/ m^2, *SD* = 2.61) from the student population of the University of Bristol (students majored in a variety of subjects) assisted with this study. Before recruitment to the study, participants were advised that they should not volunteer if they had been previously diagnosed with an eating disorder, were currently dieting or had any food allergies. In addition, males were excluded from the study due to the practical considerations associated with providing food in an *ad libitum* context and the general practice of targeting weight-loss interventions to females. Participants' relationship-specific attachment orientations were screened so that only individuals with at least one secure and one anxious attachment relationship took part. Participants also completed the Experiences in Close Relationships (ECR) questionnaire (Brennan, Clark, & Shaver, 1998) to assess dispositional attachment orientation. The protocol was approved by the local Faculty of Science Human Research Ethics Committee.

Measures.

Cover story. Participants were told that the study aimed to assess their opinions of a familiar food (chocolate chip cookies) and they would be allowed to eat as many or as few as they wanted in order to answer the questions they would be given.

***Screening questionnaires*.** Relationship-specific attachment orientation was assessed by questionnaire (Rowe & Carnelley, 2003). Participants were asked to list their ten closest significant others (regardless of the valence of the relationship) and to classify these according to the attachment orientation that best described each (descriptions of a secure,

avoidant, anxious, avoidant/anxious attachment orientations were provided as well as a "none of the above" option). Finally, participants were asked to rate on a Likert-type scale (1 = "not at all representative" - 7 = "extremely representative") the extent to which the attachment orientation by which they had classified each relationship was representative of these relationships.

Dispositional attachment orientation was measured using an adapted version of the 36-item ECR (Brennan et al., 1998). This version examined attachment orientation towards relationships generally as opposed to attachment towards romantic relationships alone (see Rowe & Carnelley, 2003). Dispositional attachment anxiety and attachment avoidance were assessed with two 18-item subscales. Participants rated their level of agreement with statements about their experiences of interpersonal relationships on a seven-point scale ranging from "disagree strongly" (1) to "agree strongly" (7). In the present study, Cronbach's alpha was .83 for the attachment anxiety subscale and .89 for the attachment avoidance subscale. The Pearson's correlation between these two dimensions was ($r(21) = -.26$, $p = .248$).

Mood. Mood was assessed using an amended version of the mood, alertness and physical sensations scales (MAPPS; Rogers et al., 2010). Six questions (To what extent do you feel [Mood variable] right now?) assessed anxiety, cheerfulness, depression, misery, relaxation and stress. Responses were made on a 10-point Likert scale anchored "Not at all" and "Extremely".

Eating style. The TFEQ (Stunkard & Messick, 1985) was used to assess disinhibited eating (16-item subscale; maximum score = 16) and restrained eating (21-item subscale; maximum score = 21). In the present study, Cronbach's alpha was .78 for the disinhibition subscale and .90 for the restraint subscale.

Priming task. Secure and anxious attachment orientation supraliminal primes were used (based on Bartz & Lydon, 2004). The primes provided participants with a brief description of either a secure or an anxious relationship. Participants were then asked to think about and visualise a relationship that they have had fitting the description, and to write down thoughts and feelings about this relationship for ten minutes.

Procedure. Participants completed the screening questionnaires on a website at least a week before their first testing session. Eligible participants were then recruited for two one hour sessions (between 11am and 2pm) at least one month apart (to reduce the possibility of demand characteristics and monotony effects associated with the food). They were asked to abstain from food for three hours prior to each session. Session order (anxious and secure prime) was fully counterbalanced and participants were randomly assigned to an order. On arrival, participants were given an information sheet to read and a consent form to sign. Baseline measures of mood were taken, along with hunger and fullness ratings (100mm visual analogue scale). The priming task was then administered. The mood measures were repeated and then the participants were presented with a bowl of 500g of chocolate chip cookies broken into irregular pieces (per 100g: 496 kcal, protein 5.9g, carbohydrate 64.3, fat 2.5g; Sainsbury's supermarkets Ltd., London, UK) and told that they may eat as many as they liked. They were also told that the experimenter had to step out of the room for ten minutes to obtain the final paperwork for the study. Participants were then asked to complete hunger and fullness ratings as well as a measure of mood. Finally, height and weight were measured. The remaining cookies were weighed after the participant had departed. This procedure was repeated for the second session, except that the TFEQ (Stunkard & Messick, 1985) was completed also and a debriefing sheet was provided at the end.

Results

Participant characteristics. Our sample had a mean dispositional anxiety score of 3.36 (*SD* = .77) and mean dispositional avoidance score of 2.66 (*SD* = .83). The mean disinhibited eating score was 6.95 (*SD* = 3.03) and the mean restrained eating score was 9.1 (*SD* = 4.59). There were no significant correlations between any of these variables ($p > .05$).

Hunger and fullness. Paired samples *t*-tests showed that there were no significant differences in baseline hunger across the anxious (*M* = 4.14, *SE* = .63) and secure (*M* = 5.05, *SE* = .47) prime conditions ($t(20) = -1.3$, $p = .21$). There were also no significant differences in baseline fullness across the anxious (*M* = 3.67, *SE* = .49) and secure (*M* = 4.05, *SE* = .57) prime conditions ($t(20) = .45$, $p = .661$).

Mood. Six separate ANOVA were conducted with session (secure and anxious) and time-point (pre- and post-prime) as repeated-measures variables. In order to account for multiple testing, a Bonferroni correction was used ($\alpha = .008$). This analysis showed that there were no significant differences in rated anxiety, cheerfulness, depression, misery, relaxation or stress across the anxious and secure prime sessions and no significant interactions between session and time-point for any of the mood variables. See Table 1 for all values associated with this analysis.

Amount eaten. In order to control for any effects of dispositional attachment orientation, attachment anxiety and avoidance were included as covariates in our analysis of the amount eaten.

An ANCOVA with session (anxious and secure prime) as a repeated measures variable and dispositional attachment anxiety, avoidance and "relaxed" mood as covariates was conducted on the amount of chocolate chip cookies consumed. Significantly more food

was consumed following the anxious prime (M = 294 kcal, SE = 28.8) than following the secure prime (M = 261 kcal, SE = 27.9) ($F(1,18) = 7.06$, $p = .016$, $\eta_p^2 = .28$). There was no main effect of dispositional attachment avoidance ($F(1,18) = .11$, $p = .74$) and no significant interaction between these variables ($F(1,18) = 1.64$, $p = .216$). There was no main effect of dispositional attachment anxiety ($F(1,18) = 1.54$, $p = .231$) but there was a significant interaction between the session (anxious and secure prime) and dispositional attachment anxiety ($F(1,18) = 6.28$, $p = .022$).

The significant interaction between dispositional attachment anxiety and session was explored further using separate Pearson's correlations. This showed a significant correlation between dispositional attachment anxiety and the amount eaten in the secure prime condition ($r(21) = .44$, $p = .04$) but no relationship between dispositional attachment anxiety and the amount eaten in the anxious condition ($r(21) = .01$, $p = .954$).

Discussion

This is the first study to demonstrate that primed attachment orientation can influence snack food consumption. Consistent with our hypothesis, the consumption of cookies was significantly higher after the anxious prime than after the secure prime. Furthermore, our effect size calculation (partial eta squared) suggests that this is a large effect (Cohen, 1988). The difference in mean amount consumed across the two sessions was 33 kcal. Over multiple snacking episodes, these additional calories would likely accrue and contribute to positive energy balance and increased body mass index (Berthoud, 2004), that is particularly associated with attachment anxiety (Wilkinson et al., 2010). However, inconsistent with previous research, we failed to replicate the relationship previously shown between our

measures of attachment anxiety and disinhibited eating. In this respect, it is likely that we were under-powered; we had a sample-size that was 10% of the sample-size tested in Wilkinson et al., (2010).

Considering the theoretical relationship between attachment anxiety and emotion regulation (see the introduction for a brief review), as well as previous research showing that attachment anxiety is related to disinhibited eating (discussed above; Goossens et al., 2011; Wilkinson et al., 2010), we suggest that it is likely that the anxious prime leads to the over-consumption of snack foods, as opposed to security priming leading to a reduction in the amount of snack foods consumed in general. This is likely an attempt to regulate the attachment-related distress caused by the prime by using food to soothe, comfort and alleviate distress.

This hypothesis is supported by the significant interaction between dispositional attachment anxiety and our primes. Further inspection of this interaction suggested that those who were generally low in attachment anxiety ate more when they were primed with attachment anxiety. However, those who were high in attachment anxiety ate a similar amount across both conditions. It is likely that our security prime was relatively ineffective. This may have been due to a potentially different level of perceived threat (greater threat in the anxious prime condition) across the conditions which resulted in differential activation of the attachment systems (which allowed the prime to have an effect in the anxious condition but not in the secure condition).

Theoretically, the success of the anxiety prime in disinhibiting eating behavior suggests that security priming may have an opposite and potentially counteractive effect. However, in order to investigate this hypothesis, a procedure in which threat is equally perceived across conditions alongside the primes would be preferable. The inclusion of a

neutral prime in order to assess the relative effects of the primes would also be advisable. If such an effect was successfully demonstrated, this would highlight an opportunity for implementation of security priming as part of a weight management intervention.

The difference in amount consumed across sessions could not be attributed to changes in mood. We suggest that participants engaged in a specific form of emotion regulation in order to alleviate feelings of insecurity. This notion is supported by research suggesting that attachment priming has effects which are distinct from, amongst many others, positive affect primes (Carnelley & Rowe, 2010). Moreover, unpublished pilot work from our laboratory showed that as attachment anxiety increases, the likelihood that food will be consumed to attain feelings of security also increases ($r(344) = .37$, $p < .001$). Whereas, there was no such relationship between attachment avoidance and the likelihood that food will be consumed to attain feelings of security ($r(344) = .06$, $p = .304$). It is likely that the range of mood measures used in this study did not take account of the desire to feel security. This possibility merits scrutiny in future studies.

Whilst mood was assessed before and after the priming procedure, a manipulation check asking about the content of participants' thoughts and the vividness of those thoughts following the priming procedure was not included here. However, the priming procedure used herein has been widely replicated, such that many studies no longer include such manipulation checks (*e.g.,* Mikulincer, Shaver, & Rom, 2011). Nonetheless, the results of a manipulation check might elucidate our understanding of effectiveness of our primes and therefore the mechanism underpinning the relationship between attachment anxiety and eating behaviour. In addition, it may be important to explicitly ask participants about their motives around their eating behaviour.

Finally, the developmental antecedents of the relationship between attachment and overeating in the context of affect regulation should be explored by future studies. Notably, Brunstrom, Mitchell, and Baguley (2005) show that disinhibited eating is related to parental pressure to plate clear and the use of food as a reward in the early eating environment. From an attachment theory perspective, it should be noted that these situations concern interactions between the caregiver and child. Thus they may be specific instances of a more general pattern of behaviour that impacts the developing attachment orientation, as well as modeling an affect regulation strategy.

Table 1

Mood ratings pre- and post-prime

	Security prime				Anxious prime				Condition	
	Pre-prime		Post-prime		Pre-prime		Post-prime			
	M	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*F*	*p*	*F*
Anxiety	2.95	.54	2.86	.53	2.48	.5	3.2	.5	.01	.94	.62
Cheerfulness	6.29	.27	6.33	.38	6.52	.32	5.43	.39	1.01	.33	5.3
Depression	2.47	.52	2.19	.44	2.43	.65	3.33	.48	.73	.4	.48
Misery	2	.35	2.48	.55	2.33	.63	3.52	.52	1	.33	3.29
Relaxation	5.67	.53	6.95	.34	6.05	.48	5.43	.38	2.04	.17	1.24
Stress	3.5	.42	2.91	.5	2.91	.48	3.05	.41	.34	.57	.39

Notes. The mean, standard error, *F* and *p*-values are shown for mood ratings across the secure and anxious pr

error = 20). ANOVA were conducted with a Bonferroni correction for multiple tests (α = .008).

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