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The role of food-cue exposure and negative affect in the experience of thought-shape fusion

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ABSTRACT

Thought-shape fusion (TSF) is a cognitive distortion that can be induced by imagining eating high-caloric foods, and involves increased guilt, feelings of fatness, and perceptions of weight gain and moral wrongdoing. Two studies were conducted to further elucidate this phenomenon. Study 1 investigated whether merely being exposed to fattening foods (without being asked to think about these foods) could induce a TSF-like experience. Study 2 investigated the relationship between negative affect and TSF-like experiences. The results suggested that TSF is specific to thinking about eating fattening foods, as mere exposure to high-caloric foods did not increase state TSF scores in healthy females relative to a neutral control condition. Furthermore, susceptibility to TSF is associated with negative affect. Healthy females with low levels of negative affect appear to be protected against TSF, medium negative affect is associated with susceptibility to TSF inductions, while those with high levels of negative affect appear to be particularly vulnerable to TSF-like experiences (even after imagining a neutral situation). Overall, the studies suggest that negative affect is associated with a TSF-like experience, and that TSF is a phenomenon that is experienced (to at least some extent) by females in the general population.

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1. Introduction

Food temptations are ubiquitous in today's society, with individuals regularly being confronted with a variety of food-related cues, including food advertisements, vending machines filled with high-caloric snacks, and a high-density of fast-food restaurants. There is evidence that exposure to food cues increases food-related thoughts, particularly in chronic dieters (Fedoroff, Polivy, & Herman, 1997). Depending on the way in which individuals think about food, there may be profound cognitive and behavioral consequences of these thoughts. Research has indicated that thinking about eating fattening, high-caloric foods can induce feelings of guilt, fatness, and moral-wrong doing in healthy women without eating disorders (Coelho, Carter, McFarlane, & Polivy, 2008). This phenomenon has been labeled as 'thought-shape fusion' (TSF; Shafran, Teachman, Kerry, & Rachman, 1999), and is postulated to exist on both state and trait levels.

State TSF has been induced by asking people to imagine eating large quantities of fattening foods, and to write a sentence about eating these foods (e.g., Shafran et al., 1999). State TSF is associated

with feelings of anxiety, guilt, fatness, perceived weight gain and/or moral wrong-doing. In contrast, trait TSF is measured by a self-report questionnaire which assesses a general tendency towards TSF-related thoughts. Trait TSF is associated with eating pathology, and occurs to a greater extent in individuals with eating disorders (Shafran & Robinson, 2004); however, a subset of healthy women also appear to experience a high degree of trait TSF (Shafran et al., 1999). In addition to the psychological factors associated with TSF (i.e., guilt, perceived weight gain, feelings of fatness), inducing state TSF can also lead to urges to neutralize the effects of imagining eating high-caloric foods, by either corrective behavior (e.g., crossing out the sentence about eating the foods, imagining exercising, or imagining eating a healthy food), or body checking to ensure that weight gain has not occurred (Radomsky, de Silva, Todd, Treasure, & Murphy, 2002; Shafran et al., 1999).

Given that TSF is associated with eating pathology, Coelho et al. (2008) hypothesized that chronic dieters would exhibit a stronger response to a TSF induction (i.e., higher state TSF scores) than would non-dieters. However, their results indicated that restrained eaters did not exhibit as strong a response to the TSF induction as did unrestrained eaters. One speculation put forth by the authors was that chronic dieters were suppressing thoughts of food during the TSF induction. This postulation is supported by previous research indicating that dietary restraint is positively correlated with cognitive suppression (Nederkoorn & Jansen, 2002).

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Therefore, in order to prevent such suppression, a more direct confrontation with food during the induction may be necessary to induce a TSF-like experience in chronic dieters.

In fact, direct confrontations with food cues in and of themselves may have similar psychological consequences as the TSF induction that has been used in previous studies (i.e., imagining eating fattening food and writing a sentence about eating this food). For example, attending to chocolates, chips and brownies led to a significant decrease in satisfaction with body weight in normal-weight chronic dieters (Fett, Lattimore, Roefs, Geschwind, & Jansen, 2009). Similarly, an interaction between dietary restraint and food-cue exposure has been found, with restrained eaters exhibiting a tendency to report lower satisfaction with their weight after exposure to high-caloric foods (Geschwind, Roefs, Lattimore, Fett, & Jansen, 2008). If food-cue exposure leads to lower weight satisfaction, presumably it may also lead to behavioral effects consistent with avoidance of high-caloric foods. Indeed, Fishbach, Friedman, and Kruglanski (2003) demonstrated that exposure to high-caloric foods leads to intentions to avoid these foods, and choice of a low-caloric food (an apple) over a high-caloric food (chocolate bar). Therefore, food-cue exposure appears to produce both emotional/cognitive effects (i.e., lowered body satisfaction) as well as behavioral effects (i.e., healthier food choices).

The tendency to have poorer body image/weight satisfaction after being exposed to high-caloric foods also appears to extend to judgments about others, particularly in individuals with higher levels of eating pathology. For example, exposure to food cues led individuals with bulimia to rate another woman's body as larger (Carter, Bulik, Lawson, Sullivan, & Wilson, 1996). Likewise, individuals who exhibited higher levels of eating pathology and also experienced higher levels of stress were more likely to judge others' bodies to be larger after food-cue exposure (Heilbrun & Flodin, 1989). This line of research suggests that exposure to food leads to changes in body image (i.e., weight satisfaction), and perhaps even perceptual distortions of body weight/shape in both the self and others. This phenomenon appears to occur predominantly in chronic dieters. Given that food-cue exposure appears to influence body satisfaction and body-size judgments, it is possible that mere exposure to food-related cues (in the absence of a TSF induction) can lead to a TSF-like experience.

Consideration of factors that trigger body dissatisfaction also leads to an examination of the role of negative affect. Forbush and Watson (2006) suggest that emotional distress can be associated with increased feelings of fatness. Therefore, it is possible that TSF-like experiences (which include increased feelings of fatness) may also be linked with distress. In fact, it appears that these triggers for body dissatisfaction (i.e., food-cue exposure and negative affect) may interact. Recent research suggests that negative affect increases attentional bias for food cues in healthy females (Hepworth, Mogg, Brignell & Bradley, 2010). Therefore, we might expect that individuals with negative affect are more likely to direct their attention to food-related cues (and subsequently experience a stronger TSF-like experience). As with food-cue exposure, negative affect also appears to have a main effect on body satisfaction and body-size ratings. Participants who were induced with a negative mood were more dissatisfied with their bodies than were those who were exposed to a positive mood induction (Taylor & Cooper, 1992). Furthermore, those individuals who were concerned with their weight/shape were more likely to overestimate the size of their bodies after being induced with a negative mood than were non-weight-concerned individuals. The authors conclude that negative mood may lead to disturbances in body size perception. Similarly, individuals with bulimia rate their body size as larger after a negative mood induction (Carter et al., 1996).

Disturbances in body size perception and body dissatisfaction, both of which can be induced by negative affect, are part of a TSF-like experience. It is therefore possible that negative affect can influence this experience, firstly by its effects on attention to food-related cues (Hepworth et al., 2010), and secondly by its direct effects on body satisfaction and body-size ratings (Carter et al., 1996; Taylor & Cooper, 1992). Some preliminary evidence for the postulation that negative affect is associated with TSF-like experiences comes from previous research demonstrating a link between depressive symptomatology and trait TSF scores (Shafran & Robinson, 2004). While the relationship between TSF and eating pathology was significant even after controlling for depression, it remains possible that negative affect in and of itself may play a distinct role in TSF-like experiences.

Based on a review of the limited existing research on TSF, and the possible impact of food-cue exposure and negative affect on TSF-like experiences, three main questions have emerged. First of all, it is unclear whether chronic dieters in particular are somewhat unresponsive to TSF inductions (as in Coelho et al., 2008), or whether they would be responsive if the induction would include a more direct (e.g., visual) exposure (as in Fett et al., 2009). Secondly, it has not yet been tested whether mere exposure to cues for high-caloric foods (in the absence of instructions to imagine eating these foods) can induce a TSF-like experience in healthy individuals without eating disorders. Given that chronic dieters exhibit changes in weight satisfaction (Fett et al., 2009; Geschwind et al., 2008) after exposure to high-caloric foods, it is conceivable that mere exposure can lead to features of state TSF (e.g., guilt, feelings of fatness). Finally, the relationship between negative affect and TSF has not yet been established. Based on the findings of Carter et al. (1996), who demonstrated that negative affect led to larger body-size ratings, we expected that negative mood inductions could lead to a heightened TSF response. The current studies were designed in order to test these questions, and investigate the effects of manipulating both the manner of TSF induction and affect on TSF-like experiences.

1.1. Study 1: hypotheses

It was expected that both TSF induction and mere food-cue exposure would induce higher levels of state TSF (e.g., guilt, anxiety, feelings of fatness, and perceived weight gain and moral wrongdoing) than would a neutral control induction. We predicted that by using a modified TSF induction, which included a direct food-cue exposure, chronic dieters would be more responsive than would non-dieters. Furthermore, based on previous research demonstrating that exposure to high-caloric foods leads to an increased likelihood of choosing a healthy food versus an unhealthy option (Fishbach et al., 2003), it was expected that both TSF induction and mere exposure to food-related cues would lead to a higher likelihood of participants choosing a healthy food (versus an unhealthy food) relative to those in a control condition. However, it was expected that only the TSF induction, but not mere exposure to high-caloric foods, would lead to higher negative affect and more neutralization behavior. This hypothesis was based on previous research demonstrating that mere food-cue exposure does not lead to changes in affect (e.g., Coelho, Jansen, Roefs, & Nederkoorn, 2009), while exposure to a TSF induction does increase negative affect (Coelho et al., 2008).

2. Method

2.1. Participants

A total of 68 female undergraduates participated in exchange for either partial psychology course credit or a voucher for €7.50. The

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