

The control dilemma in eating behavior: Influence of temptation cues in restrained versus unrestrained eaters

María Angeles Peláez-Fernández and Natalio Extremera
Universidad de Málaga

The present research explored the effects of pre-exposure to temptation primes and dieting primes on food intake, goal accessibility and explicit automatic evaluations of food-enjoyment and dieting goals among restrained and unrestrained eaters. Participants (n= 166) were randomly assigned to three conditions: food-cue, dieting, or control, in which they were exposed to incidental presentation of gourmet, fashion or geographic magazines, respectively. Words related to the goals of dieting and/or food-enjoyment were presented in a computer decision task following the incidental presentation of gourmet, dieting, and geographic magazine photographs. The computer task and the presentation of food were counterbalanced. Participants' food intake was assessed in a taste-rating task. Restrained eaters ate more than did unrestrained eaters across the three conditions. Restrained eaters who were exposed to food cues ate more than did restrained eaters in the control condition and they evaluated the goal of dieting more negatively compared to restrained eaters in the other two conditions. These findings were inconsistent with 'Counteractive Self-Control Theory' but consistent with previous studies on the effects of food-cue exposure in restrained eaters.

Autocontrol en la conducta alimentaria: influencia de estímulos tentadores en personas que hacen dieta y personas no restrictivas. El objetivo de la presente investigación fue explorar los efectos de la pre-exposición a estímulos tentadores y relativos a la dieta sobre la ingesta, accesibilidad a metas (adelgazar y disfrutar de la comida) y evaluaciones automáticas sobre dichas metas en personas en dieta y personas que no hacen dieta. Los participantes (n= 166) fueron asignados aleatoriamente a tres condiciones: tentación alimentaria, dieta y control, en las cuales fueron expuestos a una presentación incidental de revistas tipo gourmet, de moda y de geografía, respectivamente. Posteriormente, se les presentó una tarea de ordenador para evaluar palabras relacionadas con la meta de adelgazar o disfrutar de la comida. El orden de la tarea de ordenador y de comida fue balanceado. La ingesta alimentaria se evaluó en una cata de sabores. Las personas en dieta comieron más que las personas que no hacían dieta en las tres condiciones. Las personas en dieta expuestas a estímulos tentadores (comparadas con las otras dos condiciones) ingirieron más cantidad de comida y evaluaron la meta de adelgazar de forma más negativa. Estos resultados son inconsistentes con la Counteractive Self-Control Theory pero están en consonancia con estudios previos sobre los efectos de estímulos tentadores sobre personas en dieta.

The self-control dilemma has been described as a conflict between the pursuits of different goals (which may differ in priority), wherein pursuing one means abandoning the other. To successfully accomplish the higher priority goal, individuals must sometimes exercise self-control to resist temptations from lower priority goals with which the more important goal is in conflict. Self-control strategies may be demanding and require conscious awareness and cognitive resources. Thus, the 'Ego Depletion Model' proposed by Baumeister, Heatherton and Tice (1994) establishes that all self-control regulatory processes rely on a limited ego-strength resource

that operates like a muscle. According to this model, when an individual engages in a task that requires self-control, the available resources for subsequent tasks are thereby reduced, which makes subsequent self-control attempts more likely to fail. In agreement with this model, Trope and Fishbach (2000) argue that when a self-control conflict is anticipated, some individuals perceive the costs of succumbing to temptation as threats to their goal achievement and exercise conscious counteractive self-control strategies such as enhancing the value of the self-control goal in order to maintain that goal and avoid the temptation.

On the other hand, some researchers have shown that the pursuit of goals sometimes does not involve conscious intention. For instance, Bargh (1990) found that consistently activating a goal in a specific situation may lead to an automatic activation of that goal in that situation. More specifically, Kruglanski et al., (2002) found that participants previously primed by a particular goal responded faster to related objects and slower to unrelated objects. Fishbach,

Friedman and Kruglanski (2003) and Kruglanski et al., (2002) believe that once a goal is activated, the process used to achieve that goal is automatic. Moreover, they argue that exposure to either temptations or overarching goals may activate an automatic self-control process designed to avoid tempting stimuli. These authors call this internal process 'Counteractive Self-Control.' Fishbach et al., (2003) found that some individuals automatically activate a goal to resist a temptation -as measured by faster response times (RTs) to dieting-related words- without exerting any conscious effort after being primed with (a word representing) either a temptation or an overarching goal. Kruglanski et al., (2002) tested the 'Counteractive Self-Control Theory' using food as the temptation and dieting as the goal. They found that the majority of participants (all of whom had weight-loss goals) exposed to «diet-related» magazines and those exposed to magazines with illustrations of highly caloric desserts chose an apple rather than a chocolate bar as a gift. In contrast, most of the participants in the control condition (previously exposed to geographic magazines) chose the chocolate bar. All the participants were individually engaged in a lexical decision task after being exposed to the magazines. The word «diet» was the critical target. What remains unclear from this investigation is whether the results can be generalized to unrestrained eaters. It is also unclear whether the choice in the Kruglanski et al., (2002) study (apple vs. chocolate bar) was influenced by the magazine pictures or by the lexical decision task, because the presentation of magazines was always before the computer task; moreover, the strength of the effect is unknown because the authors did not measure the amount of food actually eaten by the participants.

In contrast with demonstrations of Counteractive Self-Control Theory, investigations since the early 80s have demonstrated the over-responsiveness of chronic dieters, or restrained eaters, to external food cues, such that dieters eat more after exposure to food cues. For example, Herman and Polivy (1983) introduced the concept of the 'Boundary Model of Eating Behavior' to explain why restrained eaters who limit their food intake to achieve a desirable weight become less sensitive to hunger and internal satiation signals, and correspondingly more sensitive to external cues. As a result, they are more vulnerable to overeating when confronted with external food cues than normal nondieters. Research has shown that restrained eaters overeat after being exposed to palatable food. For example, Fedoroff, Polivy, and Herman (1997) found that restrained eaters exposed to the smell of pizza ate more than did restrained eaters in the control group (no smell), whereas the smell of the pizza had no significant effect on food intake among unrestrained eaters. Similarly, restrained eaters ate more when exposed to the smell of candies (Jansen & van den Hout, 1991).

More recently, Stroebe, Mensink, Aarts, Schut and Kruglanski (2008) introduced the 'Goal Conflict Model of Eating' to explain what makes restrained eaters fail when presented with external, tempting (food) cues. This theory proposes that exposure to palatable food temporarily primes the eating enjoyment goal while inhibiting the weight control goal (as measured by slower RTs to weight-control-related words) in restrained, but not in unrestrained eaters. Stroebe et al., (2008) found that whereas priming with food cues did not influence the accessibility of dieting-related words among unrestrained eaters, restrained eaters primed with food cues inhibited their dieting goals (as measured by slower RTs to diet-related words).

Later, Papiés and Hamstra (2010) explored the effect of priming with the goal of dieting (by means of the incidental exposure of a poster announcing recipes of low-calorie diets) on food intake of restrained and unrestrained eaters in a naturalistic setting. They found that restrained (but no unrestrained) eaters reduced their food intake when primed with dieting. However, how priming with diet vs. both: control and food-related concept affects eating behavior in restrained and unrestrained eaters remains unexplored.

In addition to food intake and accessibility of dieting and food-enjoyment goals, the effect of priming with food cues has been studied by means of automatic evaluations. To examine these automatic evaluations, researchers use evaluative priming procedures (Bargh, Chaiken, Gollwitzer, & Pratto, 1992; Fazio, Jackson, Dunton, & Williams, 1995) according to which, if participants have an automatic evaluation of an object, they categorize a word (as positive or negative) faster when it has been primed by an object with the same valence (Fazio et al., 1995). Ferguson and Bargh (2004) demonstrated that automatic evaluations depend on currently activated goals: Participants previously primed with a goal, evaluated objects that facilitated goal-achievement more positively and responded more slowly to negative words, which indicates that when participants pursue a goal, negative information regarding useful objects is inhibited.

Several studies (Palfai & MacDonald, 2007; Roefs et al., 2006) have studied the effect of priming with tempting food on automatic evaluations of words related to food and weight control. Roefs and colleagues found that priming obese and non-obese participants with healthy foods prior to an evaluative task resulted in automatic preferences for low-fat foods, whereas priming with palatable food resulted in automatic preferences for high-fat food regardless of participants' weight. Palfai and MacDonald (2007) examined how temptation cues influenced the evaluation of weight-control-related words. They asked participants previously primed with either tempting food words or control words to judge as quickly as possible whether the target words presented (weight-control-related words and enjoyment words) were positive or negative. They found that restrained eaters in the food cue condition not only reduced the value of weight-control-related goals, but they also increased the value of enjoyment goals.

These studies support the view that food intake, goal activation and automatic evaluations of weight-control-related and food-enjoyment goals may be altered by contexts such as the presence of tempting food, or by priming with dieting-related or food-related words. A question that remains unanswered is how restrained and unrestrained eaters react to such priming in terms of: food intake, goal activation and automatic evaluations. This information is important because the degree to which a particular goal is pursued is reflected in these three variables: the actual behavior associated with the goal (i.e., food intake); the speed with which an individual responds to compatible vs. non-compatible objects (i.e., goal activation); and the automatic (positive or negative) evaluation of objects that facilitate or inhibit goal achievement (i.e., automatic evaluations). Specifically, this information would: 1) show us whether a particular goal (dieting vs. food-enjoyment) is activated; 2) delineate the explicit (negative or positive) automatic evaluation for that goal; and 3) demonstrate the effects of these processes on eating behavior by restrained and unrestrained eaters in different scenarios (e.g.

priming dieting, food enjoyment or no/control goals). Thus, the present study was designed to investigate how restrained and unrestrained eaters react (in terms of food intake, goal activation, and automatic evaluations) to diet, control and food-related words after exposure to tempting food pictures, pictures of slim female bodies, or control (geographic) pictures.

We hypothesized that the food-cues condition would trigger the desire to eat among restrained (but not unrestrained) eaters, who would devalue the dieting goal, and that this process would lead to overeating; on the other hand, we predicted that the dieting-cues condition would trigger the desire to control weight, which would enhance the dieting goal among restrained (but not unrestrained) eaters and reduce their food intake.

The objectives of this study were to determine the influence of external cues (neutral, food and dieting) on: a) eating behavior; b) goal activation (dieting and food enjoyment as measured by RT to diet and food-enjoyment words); and c) explicit automatic goal evaluations (dieting and food enjoyment as measured by 'positive' vs. 'negative' automatic evaluations), in restrained vs. unrestrained eaters.

Method

Participants

A total of 166 female undergraduates at University of Toronto Mississauga with an age range of 17-49 years ($M = 19.95$, $SD = 3.75$) took part in this study in return for either one credit towards their grade in an Introductory Psychology course or a payment of \$10 as compensation for their participation.

Measures

Restrained eating was determined by the *Revised Restraint Scale* (Polivy, Herman, & Howard, 1988). Subjects with scores of 12 or less were classified as unrestrained eaters and those with scores of 15 or more were classified as restrained eaters. Subjects who scored 13 or 14 on the Restraint Scale ($n = 16$), although normally considered to be unrestrained eaters according to the cut-off point of 15 (e.g., Polivy et al., 1988), were eliminated from the study to allow for clearer differentiation of restrained and unrestrained eating groups.

Self Esteem was assessed with the *Revised Feelings of Inadequacy Scale* (FIS) (Janis & Field, 1959). The FIS is a 36-item scale with 5 response options ranging from «very often»/«very much» to «not at all»/«practically never.» The FIS has acceptable internal consistency: its split-half reliability ranged from .48 to .83 for the various subscales (Fleming & Courtney, 1984).

Subjective importance of dieting was assessed with a self-constructed motivation scale which asked: «How important is maintaining your diet (if you are dieting)?» as well as other goal-related questions. Participants answered these questions on a 5-point scale, ranging from «not at all» to «extremely».

In order to check whether participants really noticed the priming cues, the following questions were asked: «Did you look any of the magazines left on the table of the lab at the beginning of your participation in this study?» (Yes, No); «If so, what kind of magazines you were looking at? Could you print the names of the magazines?»; «How long did you spend looking at these magazines (in minutes)?».

Procedure

At the beginning of the testing session, a cover story (that the participants were taking part in market research testing a new product) and the procedure of the study were presented to the participants. Participants were given a consent form to read and sign and were instructed to ask any questions that they might have about the procedure before signing the form. They were randomly assigned to one of the following conditions: 1) control (neutral cues); 2) diet images; or 3) gourmet food cues.

Presentation of control cues (furniture, geographic), dieting/thinness cues (fit females, slim models) and food cues (cake, chocolate, cookies, ice cream) was accomplished by leaving magazines with cover pictures of the relevant cues on the table in the lab for 10 minutes while students arrived and filled out their consent forms. For the control-cues condition, magazines with covers depicting geographic scenes and furniture were presented (e.g., *Ikea*, *National Geographic*); in the dieting/thinness condition, fashion magazines with cover pictures of slim female models (e.g., *Vogue*); and in the food-cues condition, magazines with attractive and explicit photos of fattening foods (e.g., *Gourmet*). After the cue exposure, participants were presented with the list of goals to be rated on a computer, a reaction time task (responding to goal-related words) and food (cookies) that they were asked to taste and rate as the market research aspect of the study.

Dieting (*slim, thin, fit, diet, fat, overweight, flabby, binge*), enjoyment (*pleasure, calm, cope, reward, distraught, stressed, discontent, punishment*), and control (*polite, wise, cultured, moral, rude, foolish, uncivilized, corrupt*) words were presented on a computer to assess reaction times to different goal-related stimuli. In order to prevent a possible confound due to the order in which the words were presented or the number of words representing positive vs. negative goals, we introduced the same number of words representing positive and negative goals, and the computer was programmed to present the words in a random order for each participant. Subjects were asked to judge as quickly as possible whether the word presented was positive or negative. The key *P* would indicate 'positive,' whereas the key *Q* would indicate 'negative.' Participants were given a practice trial with control words, before performing the computer task. Following previous work of this kind, (e.g., Aarts, Custers, & Holland, 2007; Aarts & Dijksterhuis, 2000; 2003), we assumed that the time taken to recognize a goal in this task would reflect accessibility of representations of that goal concept. Thus, delayed response latency would be an indicator of inhibition of the goal, whereas short RT would indicate goal activation.

Participants were then asked to taste (one flavor at a time) 3 different kinds of cookies and to complete a questionnaire about them, with questions assessing the taste, texture, color, etc. of the cookies as a market test of a «new product about to be introduced.» We focused the participants' attention on the cookie-rating questionnaires by giving detailed instructions about not changing ratings after tasting a new flavor of cookie, clearing their palates with a sip of water between flavors, and not moving on to a new flavor of cookie until they were sure about their ratings. We left the participants alone in the room to do their ratings. They had 10 minutes to finish and were explicitly encouraged to eat as much as they wanted of every kind of cookie, as long as they did not go back and change any ratings after tasting a new flavor.

The order of the food rating and goals reaction time tasks presentation was counterbalanced: Half of the participants were exposed to food before the computer task; for the other participants the order was reversed.

Before leaving the study, all the participants were asked to complete the Revised Feelings of Inadequacy Scale, the goal-motivation scale, and the Restraint Scale. They were also asked to indicate whether they had had feelings of guilt after having eaten the cookies in the study, by choosing one of the following answers: ‘not at all,’ ‘slightly,’ ‘moderately,’ or ‘very much’. Participants were debriefed about the study, weighed and measured, and asked not to talk about the study outside the laboratory.

The design of this study was thus 2 (Restraint condition: restrained vs. unrestrained eaters) × 3 (Priming condition: neutral, thin bodies, food cues) × 2 (Presentation order: food first, goals first).

Data analysis

A series of Analysis of Variance (ANOVA) tests were conducted on food intake, RTs and automatic evaluations, using restraint and priming conditions as independent variables, to examine the effect of external cues on food intake, RTs and automatic evaluations in restrained and unrestrained eaters.

Results

Influence of order of tasks (presentation of goals and presentation of food)

No significant differences were found either for food intake, RT to words representing goals or automatic goal evaluations based on the order of tasks.

There was no interaction between restraint and order of tasks on food intake, RTs or automatic evaluations ($p > .2$). Nor there was interaction between cue condition and order of tasks on any of the dependent variables. So order of tasks was not considered further in the analyses and thus all of the following analyses are 2×3 ANOVAs.

Influence of external cues on food intake in restrained and unrestrained eaters

There was a significant main effect of cue condition on food intake [$F_{(2,148)} = 4.099, p < .05$]. We performed planned t tests to compare restrained and unrestrained eaters separately in the three cue conditions. We found that restrained eaters in the gourmet/food cues condition consumed significantly more ($M = 102.55, S.D. = 52.34$) than did restrained eaters in the control condition ($M = 73.90, S.D. = 30.85$) [$t_{(2,50)} = 2.333, p < .05$] (Table 1), and marginally more than did restrained eaters in the diet condition ($M = 86.88, S.D. = 38.94$). There was no significant difference for restrained eaters between the dieting condition and the control condition ($p > .2$).

No significant differences were found among unrestrained eaters.

There was also a significant main effect of restraint condition on food intake [$F_{(1,149)} = 5.285, p < .05$] such that restrained eaters ate significantly more than did unrestrained eaters.

We performed planned t-test comparisons between restrained and unrestrained eaters in each condition to explore the effect of the

priming conditions. Only the comparison in the gourmet condition was significant, indicating that it was this cell that was responsible for the restraint main effect. In the food cues condition, restrained eaters ate more than did unrestrained eaters [$t_{(2,53)} = 1.97, p < .05$]. No significant differences between restrained and unrestrained eaters were found either in the dieting condition or the control condition ($ps > .15$) (Table 1).

Table 2 shows the effect sizes (eta squared) of restraint and cue conditions over food intake. There was no interaction between restraint and cue conditions ($p > .1$).

Influence of external cues (neutral, dieting, gourmet) on RT and automatic evaluations of words representing goals in restrained vs. unrestrained eaters

ANOVA tests were performed on RT (milliseconds), using restraint and priming condition as the independent variables. Neither restraint nor priming condition yielded main effects on any of the three types of words representing goals (food-enjoyment, dieting and control) ($ps > .1$). There was no interaction between restraint and priming condition ($p > .2$). Table 2 shows the effect sizes (eta squared) of restraint and cue conditions over goal activation.

The evaluations (‘positive’ vs ‘negative’) of the 24 words presented were analyzed for restrained and unrestrained eaters

Table 1
Cookie consumption: Means (standard deviations), among restrained and unrestrained eaters across the 3 conditions (gourmet, dieting and control)

| | Restrained (75) | Unrestrained (75) | Total (150) |
|--------------|-----------------|-------------------|---------------|
| Gourmet (53) | 102.55 (52.34) | 79.07 (43.63) | 90.59 (49.08) |
| Dieting (49) | 86.88 (38.94) | 77.38 (32.97) | 82.23 (36.08) |
| Control (48) | 73.90 (30.85) | 62.31 (29.71) | 68.10 (30.53) |
| Total (150) | 88.16 (43.04) | 73.17 (36.57) | 80.66 (40.51) |

Table 2
Effect sizes of restraint and cue conditions over food intake and goal activation

| | F | df | p | η^2 |
|---------------------------------------|------|----------|-------|----------|
| <i>Food intake</i> | | | | |
| Restraint | 5.37 | (1, 150) | .02** | .04 |
| Cue condition | 4.27 | (2, 150) | .02** | .06 |
| Restraint × Cue condition | .48 | (2, 150) | .62 | .01 |
| <i>Food enjoyment goal activation</i> | | | | |
| Restraint | .00 | (1, 150) | .99 | .00 |
| Cue condition | .09 | (2, 150) | .92 | .00 |
| Restraint × Cue condition | 1.70 | (2, 150) | .19 | .02 |
| <i>Dieting goal activation</i> | | | | |
| Restraint | 2.53 | (1, 150) | .11 | .01 |
| Cue condition | .12 | (2, 150) | .89 | .00 |
| Restraint × Cue condition | .71 | (2, 150) | .50 | .01 |
| <i>Control goal activation</i> | | | | |
| Restraint | 1.98 | (1, 150) | .16 | .01 |
| Cue condition | .29 | (2, 150) | .75 | .00 |
| Restraint × Cue condition | 1.42 | (2, 150) | .25 | .02 |

*Notes: ** p < .05*

across the three cue conditions. The only significant difference was found with the word «diet». An ANOVA showed that there was a significant effect of cue condition on the evaluations of the word «diet» among restrained [$F_{(2,59)} = 4.282, p < .02$] but not unrestrained eaters [$F_{(2,65)} = 1.191, p = .342$]. We used a Bonferroni correction to make multiple comparisons.

Restrained eaters in the food cues group evaluated the word «diet» as more negative ($p < .02$) than did restrained eaters in the control condition. Other comparisons (dieting vs. control condition; food cues vs. dieting condition) were not significant ($p = .830$, and $p = .247$) (Table 3).

Influence of other variables (Self-esteem, subjective importance of dieting)

No significant differences were found either for food intake, RT to words representing goals or automatic goal evaluations based on self-esteem or subjective importance of dieting ($ps > .5$). There was no interaction either between restraint and self-esteem or between restraint and subjective importance of dieting on food intake, RTs or automatic evaluations ($ps > .4$). Nor there was interaction between cue condition and self-esteem or between cue condition and subjective importance of dieting on any of the dependent variables ($ps > .5$).

Post-experimental questions

We conducted an ANOVA to explore feelings of guilt after eating. Restrained eaters (regardless of the experimental condition and amount of food eaten) reported feeling significantly guiltier after eating the cookies in this study than did unrestrained eaters [$F_{(3,149)} = 21.908, p < .001$].

Discussion

The findings of this study confirmed our hypothesis that the presentation of palatable food primes would increase the amount eaten by restrained eaters. Rather than reducing the food intake of restrained eaters who had been primed with palatable food cues as Counteractive Self-Control Theory suggests (Fishbach et al., 2003), subtly presented food photos in the current study induced

restrained eaters to eat more than restrained eaters in the control or diet conditions. These results replicate those found using food smells and thoughts (rather than photos) by Fedoroff et al., (1997). However, the presentation of thin female images did not reduce the amount eaten by restrained eaters (or unrestrained eaters). It is possible that diet cues need to be stronger or more readily apparent than food cues in order to enhance dietary restraint. The findings of this study also partially confirmed our hypothesis that the presentation of palatable food cues would affect the evaluation of the dieting goal negatively for restrained eaters; they rated the word 'diet' as more negative after exposure to food cues. Moreover, this devaluation of «diet» was not dependent on having already overeaten and thus broken one's diet: the effect appeared irrespective of whether the evaluation was assessed before or after eating. Such exposure had no impact on the evaluation of «diet» among unrestrained eaters. It should be noted, however, that no differences in the evaluation of other dieting-related words were found among restrained or unrestrained eaters.

These eating and word-rating results are consistent with the 'Goal Conflict Model of Eating' (Kruglanski et al., 2002; Stroebe et al., 2008) among restrained eaters in the gourmet condition. The results of this study (i.e., increased food intake and negative rating of the word «diet» among restrained eaters in the gourmet condition) suggest that exposure to palatable food could have temporarily primed the eating enjoyment goal while inhibiting the opposite (weight control) goal in restrained (but not unrestrained) eaters, making them succumb to tempting (food) cue presentations and judge the goal of dieting as more negative.

The seemingly inconsistent findings between 'Counteractive Self-Control Theory' (Fishbach et al., 2003) and the majority of the findings in the literature, including ours, could be explained by two methodological differences (Papies, Stroebe, & Aarts, 2008). First of all, Fishbach and colleagues measured dieters' self-regulatory success (regulating food intake) as a moderator variable in the intention-behavior link, whereas we did not measure self-regulatory success. It may be that the Fishbach et al., (2003) participants were 'successful' dieters, whereas the restrained eaters in our study are generally more 'unsuccessful' dieters. The second methodological difference between Fishbach et al. and our study is that they did not differentiate between restrained and unrestrained eaters, as we did, but between individuals claiming high versus

Table 3
Comparisons of cue conditions on automatic evaluations to the word «diet» among restrained eaters

| (I) condition_magazines | (J) condition_magazines | Mean difference (I-J)* | Std. error | Sig. | 95% CI** | |
|----------------------------|----------------------------|------------------------|------------|------|-------------|-------------|
| | | | | | Lower bound | Upper bound |
| Dieting: fitness magazines | Gourmet: food magazines | -.264 | .150 | .247 | -.63 | .10 |
| | control condition | .164 | .150 | .830 | -.20 | .53 |
| Gourmet: food magazines | Dieting: fitness magazines | .264 | .150 | .247 | -.10 | .63 |
| | control condition | .429* | .148 | .016 | .06 | .79 |
| Control condition | Dieting: fitness magazines | -.164 | .150 | .830 | -.53 | .20 |
| | Gourmet: food magazines | -.429* | .148 | .016 | -.79 | -.06 |

Notes: * The automatic evaluations ('positive' and 'negative') were measured by assigning number 1 to 'positive'; and number 2 to 'negative'. Thus, when the Mean Difference (I-J) is over zero, it means that the automatic evaluations to the word 'diet' in the condition I were more negative than in the condition J, whereas when I-J is below zero means that the automatic evaluations to the word 'diet' in the condition I were more positive than in the condition J.

** CI: Confidence interval.

low subjective importance of dieting. Finally, the manipulation in our study was actually quite subtle in that the magazines with the food or diet cue pictures were simply left on the table in front of the participants, who did not necessarily have to interact with the materials, but nonetheless appeared to have noticed them.

Some of the findings of the present study were contrary to our predictions. For example, the restrained eaters in the food cues condition did not activate the food-enjoyment goal when compared to restrained eaters in the control condition, although they ate more and evaluated the dieting goal more negatively. The absence of a reaction time effect may reflect a weakness of our measure, or that food enjoyment words are not made more salient by pictures of food. Further research is needed to understand this issue more completely.

Another prediction not confirmed is that restrained eaters exposed to pictures of thin female bodies would reduce their eating, activate their diet goals, or evaluate the dieting goal more positively when compared to restrained eaters in the control group. This failure could possibly be explained either by the weakness/subtlety of our manipulation, or by the chronic lack of

self-regulatory success in restrained individuals. Clearly, more investigation needs to be done to examine how successful and unsuccessful restrained and unrestrained eaters behave in terms of food intake, goal activation and automatic evaluation in different priming conditions.

In conclusion, the present data demonstrate that the presentation of tempting food cues does indeed increase food intake in restrained eaters and moreover makes the diet goal more negative in restrained but not unrestrained eaters. It seems, however, that relatively weak diet-related cues do not necessarily have an effect on eating or goal activation. These findings have implications for clinical practice. Stimulus control, avoiding tempting high calorie food cues, is suggested to increase the success of weight control programs.

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