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Research Article

Hedonic Impulse Versus Slim Ideal in Young Dieting Females: The Moderating Role of Disinhibition

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Background

In today's food-rich society, the prevalence of dieting is remarkably high among adolescent girls and young females striving to achieve their ideal slim figure. Nonetheless, most individuals fail to maintain long-term dieting plans due to increased hedonic cravings for appetitive, high-calorie foods. Young dieting females are often confronted with two antagonistic motivational conflicts: the hedonic impulse and the pursuit of the slim ideal. Moreover, the trait of disinhibition plays a crucial role in dieting failures and hedonic overeating.

Objective

The present study aims to examine the moderating effects of the disinhibition trait on the antagonistic motivational processes between hedonic impulse and slim ideal pursuit among young dieting females.

Methods

Participants with high and low disinhibition traits performed a food-versus-figure task to determine the conflicting motivational processes.

Results

The findings showed that the balance between the hedonic "hot" and the slim ideal "cold" pathways was moderated by disinhibition. Specifically, only high-disinhibition dieters exhibited stronger food conflict than slim conflict, suggesting a pronounced preference for appetitive foods over the slim body ideal.

Conclusion

These findings enhance our understanding on the role of automatic hedonic impulse and the disinhibition trait in dieting failure, potentially clarifying why some individuals are more vulnerable to hedonic overeating and food addiction.

1. INTRODUCTION

In modern society, where food is abundant, a tremendous number of adolescent girls and young females frequently engage in dieting practices.[1,2] However, most of them fail to maintain dieting plans in the long term. In addition, owing to frequent exposure to palatable and indulgent foods, the appetitive-driven impulse of young dieters is amplified, often resulting in hedonic overconsumption of delicious foods.[3,4] Self-claimed dieting has actually become a risk factor, as individuals often regain the weight they previously lost and may even gain more.[5,6]

In fact, prior research has shown that young dieting females are more likely to pursue weight loss for the sake of achieving a slim body rather than for physical health.[7,8] In light of dual-process theory,[9] young females who use dieting as a weight loss approach face two competing processes: the hedonic-craving impulse ("hot" pathway) versus

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the slim ideal ("cold" pathway). As such, young dieting women may endure ongoing conflicts between hedonic cravings for delicious foods and reflective motives for a slim body in daily life, generating unavoidable cognitive dissonance. Through frequent exposure to tempting foods, the hedonic impulse pathway may undermine the strength of the slim ideal drive, consequently leading to overeating and binge-eating.[10]

To date, research focusing on the conflict between hedonic impulse and the slim ideal among young dieting females is scarce. Recently, a novel food–figure conflict task, based on the logic of the stroop color-naming paradigm, was adopted to assess the antagonistic motivational processes between hedonic appetite and the slim ideal in young dieting females.[11] The findings demonstrated that young dieting females had delayed reaction times (RTs) and lower accuracy rates in the "food" distracting context relative to the "slim body" distracting context, reflecting a stronger prioritization of appetitive foods over the slim ideal.[12,13] Indeed, due to the fact that adopting drastic "all-or-nothing" eating rules often triggers the opposite effect,[8,14,15] women who follow slim-driven dieting strategies are more likely to experience uncontrolled eating or binge eating.

Researchers have indicated that disinhibition is a central risk factor for dieting failures.[16-18] Disinhibition, an important opportunistic eating trait, refers to a habitual tendency to overeat in response to emotional distress or external food cues in a food-rich environment.[16,18] It represents a general rather than a specific trait, reflecting a set of enduring characteristics such as eating without hunger, eating in response to negative affect, overeating in the presence of others, and being unable to resist palatable food temptations.[16] Studies have demonstrated that disinhibition is associated with impulsivity, unhealthy food choices, attentional biases toward appetitive food imagery, obesity, and weight gain.[19-21] Although theory and research have suggested that dieters are prone to disinhibitory and binge eating,[22-24] it remains unclear whether the disinhibition trait moderates the conflicting processes between hedonic impulse and the slim ideal among young dieting females.

Although women who self-identify as "dieting" to achieve a slim body tend to display a heightened preference for hedonic appetite over the slim ideal,[11,13,25] and given that dieting is closely linked to disinhibited eating,[22,23] further research is warranted to investigate whether disinhibition moderates the antagonistic processes between hedonic appetite and slim ideal motivations. Accordingly, using the novel food-versus-figure conflict task, the present study examined the moderating effects of disinhibition on the conflict between hedonic impulse and the slim ideal among young dieting females. Given that disinhibition is a critical factor influencing dieting success,[16,22] we expected greater conflict in the food-distracting context compared to the slim-distracting context among high-disinhibition dieters, but not among their low-disinhibition counterparts.

2. MATERIALS AND METHODS

2.1. ETHICAL CONSIDERATIONS

The study involving human participants was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of the Affiliated Hospital of Hangzhou Normal University (approval number 2024-E2-KS164). Informed consent was obtained from all participants involved in the study in accordance with the Declaration of Helsinki.

2.2. PARTICIPANTS

The sample comprised 40 high-disinhibition dieting women and 40 low-disinhibition peers. All participants were right-handed and reported currently engaging in dieting at the time of the study. Participants were recruited from a university campus through an online platform (Sojump), targeting females who were "currently dieting to maintain or lose weight," a criterion based on previous research.[26] In addition to this criterion, participants were selected based on scoring either above or below 3 on the disinhibition scale, consistent with prior published work.[27] A priori power analysis was conducted using G-power, with 95% power ($\alpha = 0.05$) and a moderate effect size ($f = 0.25$) to detect an interaction effect. The analysis indicated that a sample size of 36 participants per group was required to achieve the desired power.[28] Table 1 summarizes the characteristics of the sample. High-disinhibition participants had significantly higher body mass index (BMI) than their low-disinhibition counterparts ($t = 4.97$, $p=0.001$). Participants were excluded if they met any of the following criteria: pregnancy, history of mental illness, disordered eating, smoking, or alcohol usage.

2.3. MATERIALS

For disinhibition, the Dutch Eating Behavior Questionnaire (DEBQ) and the Three-Factor Eating Questionnaire (TFEQ) are the most widely used assessments of disinhibited eating.[18] Recent research has indicated that the DEBQ disinhibition scale demonstrates better internal consistency and validity than the TFEQ disinhibition scale.[29,30] The DEBQ includes two subscales – emotional eating (13 items) and external eating (10 items). Each item is rated on a five-point scale, from one (never) to five (very much).[31] By calculating the mean score of the two subscales, we obtained a DEBQ measure for disinhibition.[1,27] In Chinese college samples, the DEBQ has shown support for its original factor structure, internal consistency, and convergent validity.[32]

For hunger level, hunger was assessed using the item: "how hungry do you feel at present?" Participants responded on a scale ranging from 0 (not hungry at all) to 7 (extremely hungry).

For demographics, information was collected on participants' height, weight, and age.

Table 1. Demographic characteristics of the samples

Variable	Participants with high disinhibition	Participants with low disinhibition	*t*-values
	Mean (SD)	Mean (SD)	
Age	20.18 (1.39)	19.78 (1.38)	1.29
Disinhibition	3.55 (0.55)	2.30 (0.39)	11.70***
BMI	24.18 (3.47)	20.54 (3.08)	4.97***
Hunger	3.64 (1.90)	3.35 (1.42)	0.77
Fast time (hours)	7.09 (4.75)	6.57 (4.27)	0.52

Notes: BMI: Body mass index; SD: Standard deviation.
***$p<0.001$.

2.4. PROCEDURE

Participants were instructed to abstain from eating or drinking anything other than water for at least 2 h before the experiment. Upon arrival at the laboratory, participants reported their fasting status and current hunger level. They then completed the food-versus-figure task.

The food-versus-figure task, based on a word-image interference paradigm, was adopted to evaluate two antagonistic processes: hedonic impulse versus slim ideal.[11] Specifically, delicious food and thin-related words, presented in an outer glowing font, were superimposed onto images depicting both thin figures and appetizing foods. The relationship between target words and distracting images varied in congruency, leading to four distinct stimulus trial types: (i) thin-figure words paired with thin-figure images (figure congruent), (ii) food words paired with food images (food congruent), (iii) food words paired with figure images (figure incongruent), and (iv) figure words paired with food images (food incongruent). In each trial, a fixation cross was displayed at the outset, followed by a random inter-stimulus interval ranging from 1,500 to 2,500 ms, after which the stimulus pair was presented for 1,000 ms. Participants were required to press response buttons to categorize the words as either "food" or "figure," while disregarding the distracting images. The experimental procedure in this study was consistent with that in prior research,[11] except that the task included four blocks of 80 trials each. For the food-versus-figure task, the main dependent variables were conflict indices, which were obtained by subtracting the average RT of correct congruent trials (food and figure distracting conditions) from the average RT of the corresponding incongruent trials.[33] This calculation generated the food conflict and slim conflict indices.

3. RESULTS

To assess the effect of disinhibition status, a two-way 2 (conflict type: food-conflict versus slim-conflict) × 2 (disinhibition status: high versus low) mixed-design analysis of covariance was conducted for conflict indices, with hunger, fasting time, and BMI as covariates. A significant main effect was found for conflict type ($F_{[1, 75]} = 6.84$, p=0.011, $\eta^2 = 0.08$). The main effect of disinhibition status was not significant ($F_{[1, 75]} = 0.31$, p=0.58, $\eta^2 = 0.004$). However, their interaction effect was significant ($F_{[1, 75]} = 9.39$, p=0.003, $\eta^2 = 0.11$). A subsequent simple effect analysis indicated that high-disinhibition participants had a stronger food conflict than slim conflict ($F_{[1, 75]} = 16.23$, p=0.001, $\eta^2 = 0.18$). In contrast, there was no difference between food conflict compared to slim conflict for low-disinhibition participants ($F_{[1, 75]} = 0.37$, p=0.55, $\eta^2 = 0.005$) (Figure 1).

We also performed a 2 (distractor context: food versus figure) × 2 (congruence: congruent versus incongruent) × 2 (disinhibition status: high versus low) three-way analysis of covariance for accuracy rates, using the same covariates. A significant main effect was found for the distractor context ($F_{[1, 75]} = 60.22$, p=0.001, $\eta^2 = 0.45$) and for congruence ($F_{[1, 75]} = 112.17$, p=0.001, $\eta^2 = 0.60$). Nevertheless, the main effect of disinhibition status was not significance ($F_{[1, 75]} = 1.54$, p=0.22, $\eta^2 = 0.02$). A simple effects analysis of the distractor context × congruence interaction ($F_{[1, 75]} = 58.85$, p=0.001, $\eta^2 = 0.44$) showed that accuracy in the food-distractor context was significantly lower than in the figure-distractor context, but this effect was present only in the incongruent condition ($F_{[1, 75]} = 77.28$, p=0.001, $\eta^2 = 0.51$), not in the congruent condition ($F_{[1, 75]} = 0.79$, p=0.38, $\eta^2 = 0.01$) (Figure 2). However, the three-way interaction effect was not significant ($F_{1, 75]} = 0.44$, p=0.51, $\eta^2 = 0.006$).

4. DISCUSSION

The present study demonstrated that stronger food conflict compared to slim conflict only arose in high-disinhibition dieters but not in their low-disinhibition counterparts. Although the results regarding accuracy rates were not consistent with the findings of the conflict index, the three-way interaction in accuracy rates did not reach the significance threshold. This may be because the word-naming task was relatively easy, and the accuracy rate index was not as sensitive as response latency decay.

Research has indicated that disinhibition, a robust predictor of weight gain,[34] is correlated with unhealthy food decisions, overeating, weight cycling, low awareness of satiety, dietary helplessness, and impulsivity.[16,18] Thus, high-disinhibition dieters are often labeled as engaging in "paradoxical dieting," characterized by automatic attentional biases toward food-distracting images and a lack of interference from slim body images. This suggests that high-disinhibition dieters subconsciously allocate more attentional weight to appetitive food cues relative to slim body cues.

The current findings suggest that high-disinhibition dieters exhibit "sweet lies," involving a discrepancy between their dieting intent and behavior. The meta-cognitive model predicts that such attitude discrepancy enhances attention and information processing toward food-related objects, thereby making overeating more likely even when attempting to restrict intake of a particular food.[35] Supporting this, an implicit preference for forbidden foods was positively

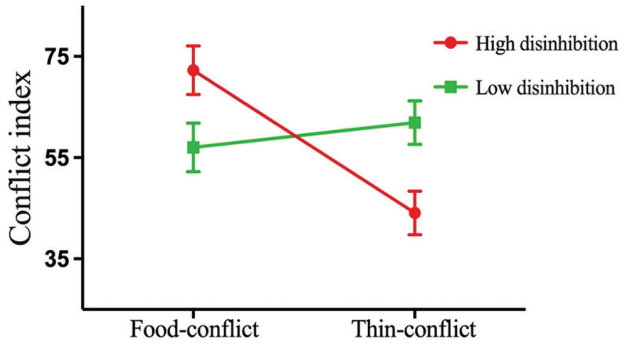

Figure 1. Interaction effect of conflict index on disinhibition status and conflict type

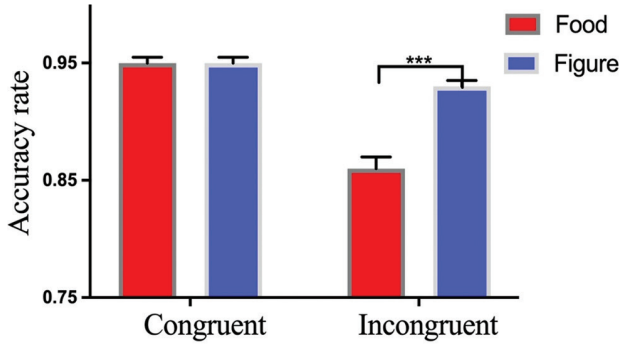

Figure 2. Interaction effect of accuracy rate on distractor context and congruence

associated with a positive attitude toward thinness, a relationship that existed only among individuals with high, but not low, disinhibition.[36] In addition, recent research further demonstrated that the discrepancy between implicit and explicit attitudes toward chocolate positively predicts disinhibited chocolate consumption in a laboratory setting.[37]

Many behaviors, particularly eating behaviors, are not guided by rational decisions based on long-term benefits, but rather by habitual responses cued by environmental stimuli, resulting in actions that are not preceded by conscious reflection.[38,39] In light of the dual-process theory,[40] hedonic-driven incentives are characterized by automatic response tendencies to delicious foods without deliberation, whereas the slim ideal motive involves cumbersome and reflective processing, dependent on conscious engagement and self-regulatory capacity. The balance between hedonic impulse and slim ideal pathways appears to be moderated by the trait of disinhibition. High-disinhibition dieters unconsciously showed a greater predilection for appetitive foods, in which the strength of hedonic-driven incentives surpassed the pursuit of a slim body.

Despite its implications, the current study has certain limitations. First, considering that males and females differ in body image and disordered eating patterns,[41] future research should investigate the generalizability of the current findings to male populations. Second, the extent to which these findings generalize to populations in other countries such as the United States remains unclear. For example, Chinese individuals with bulimia nervosa are comparatively less likely than their United States counterparts to report vomiting or laxative use as compensatory strategies following binge-eating episodes.[42] Third, while disinhibition is asymmetrically associated with automatic preferences for palatable foods and weight gain, longitudinal research utilizing this task could provide a stronger foundation for clarifying the relationship between disinhibition, automatic approach processes, and long-term weight change.

5. CONCLUSION

In summary, using an objective behavioral paradigm, the present study examined the moderating role of the disinhibition trait in the motivational conflict between hedonic impulse and slim ideal among young dieting females. The findings showed that the balance between the appetitive ("hot") and slim ("cold") pathways was influenced by disinhibition. Specifically, only high-disinhibition dieters demonstrated a robust predilection for appetitive foods over a slim body, characterized by stronger food conflict than slim conflict. These novel results emphasize the importance of considering automatic approach tendencies toward palatable foods, especially among high-disinhibition dieters.

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CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

AUTHOR CONTRIBUTIONS

Conceptualization: Shuaiyu Chen, Hong Chen
Data curation: Debo Dong, Lirong Yu, Jiangtao Peng
Investigation: Haozheng Shen, Jiangtao Peng
Methodology: Hong Chen, Todd Jackson
Writing–original draft: Shuaiyu Chen
Writing– review & editing: Todd Jackson, Matthew Lock, Hong Chen

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of the Affiliated Hospital of Hangzhou Normal University (approval number 2024-E2-KS164). Informed consent for participation was obtained from all subjects in accordance with the Declaration of Helsinki.

CONSENT FOR PUBLICATION

Before the experiment began, participants were provided with detailed information about the potential benefits and risks associated with the study. They were explicitly informed that their anonymized data might be used for academic publication and that they retained the right to withdraw consent at any stage. Confidentiality of participant information was maintained throughout data processing, analysis, and academic publication.

DATA AVAILABILITY STATEMENT

The original contributions presented in this study are included in the manuscript, and the data supporting the findings are available from the corresponding author upon reasonable request.

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