

LBP-089 The displacement mechanism: a new explanation and treatment for obesity

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OBJECTIVES

In our previous study [1], a 16-year-old boy, 104 kg, wrote, "Does anybody have any info on how to resist the urge to eat, knowing that later on you'll regret? I need help bad."

Regret is commonly expressed by individuals who overeat. Ninety-five percent of binge eaters reported feeling regret, guilt, or anger with themselves after bingeing [2].

An 18-year-old girl, 111 kg, stated: "Every time I overeat, I would feel bad afterwards. When I overeat, I would feel bad every time, but I would mainly overeat just to eat whatever was available." [4]

It is as if something pushes the person to overeat, typically whatever food is available, like a switch being pulled in the brain, or a tape playing, and the individual must go along with the tape until it's done. All addictions exhibit such irrepressible behavior, and the behavior produces substantial regret and negative consequences in the person's life.

Furthermore, addictive behavior doesn't make sense to the person involved nor to others around them. For example, why binge eat or get drunk when the boss yells at you? It is out-of-context behavior; the behavior doesn't fit with the situation at hand.

Displacement activity or displacement behavior is normal behavior that happens out-of-context [3, 5] and is also irrepressible. It thus resembles addictive behavior. Displacement behavior occurs in all animals, from fruit flies to humans, and allows the animal to deal with situations that cannot readily be faced nor avoided or are thwarting. A bird threatened by a predator will preen its feathers rather than flee or fight. The displacement mechanism is thought to stem from opposing brain drives in equilibrium, such as fight or flight, that build up energy in the brain to commit to one or the other drives, which then overflows and is displaced to another drive, such as the grooming drive or the feeding drive.

Displacement behavior may occur regarding food. Both male turkeys and cocks when fighting, will suddenly stop and go eat, if food is available, even though they are not hungry, and then go back to fighting again [3].

The displacement mechanism plays an adaptive role. Yet, if excessively expressed by the animal, from recurring untenable situations, the mechanism may go rogue and become destructive. For example, stressed or socially isolated dogs may lick their paws raw (excessive displacement to the grooming drive), causing significant damage to the paws, termed acral lick disorder. We posit that excessive displacement to the feeding drive may result in weight gain and obesity.

Moving the opposing drives out of equilibrium, by resolving a person's problems (displacement sources), theoretically should halt the displacement mechanism and might comprise an intervention for overeating/obesity, as well as other addictions. If the individual can either face or escape from the problematic situations, the displacement behavior of overeating should stop on its own without struggling and without willpower.

An 18-year-old female, 111 kg, lost 24 kg in our previous study [2] but gained back 9 kg and requested to be in a subsequent study. She described a situation at her job that supported the notion that the displacement mechanism might serve as a basis for a weight loss intervention. "I was stressed out at work. I was getting in trouble for things that weren't actually happening. I was being falsely accused. I remembered I had a Pop-Tart in my car. So, I went out into my car, and the next thing I knew I'd eaten like three Pop-Tarts. And then after that, every 15-minute break I would have, I would go out to my car and eat Pop-Tarts... The more stressed out I got at work, the more I found myself spending time in my car eating..."

MATERIALS-METHODS

An intervention for overeating/obesity (eating addiction) was designed based on the displacement mechanism construct and consisted of:

- 1) Identifying life situations the person could not face nor avoid or were frustrating, e.g. an unreasonable boss, and
- 2) Developing action plans to deal with each situation, e.g. confront the boss.

The previously described 18 yo. female, baseline weight 86 kg and BMI 28.1, underwent the displacement-based intervention for 10 weeks for treatment of overeating/obesity (eating addiction), as an exploratory study.

Replacing the displacement

In addition to dealing with the sources of the displacement, it also is possible to replace the displacement with another displacement that is less destructive. This likely needs to be another drive, for example, the breathing drive with deep breathing maneuvers. The participant practiced deep breathing when stressed.

Study procedure

The participant would identify and write down her displacement sources (difficult situations) and then, underneath each source she would write an action plan to deal with that particular source. These were updated weekly.

RESULTS

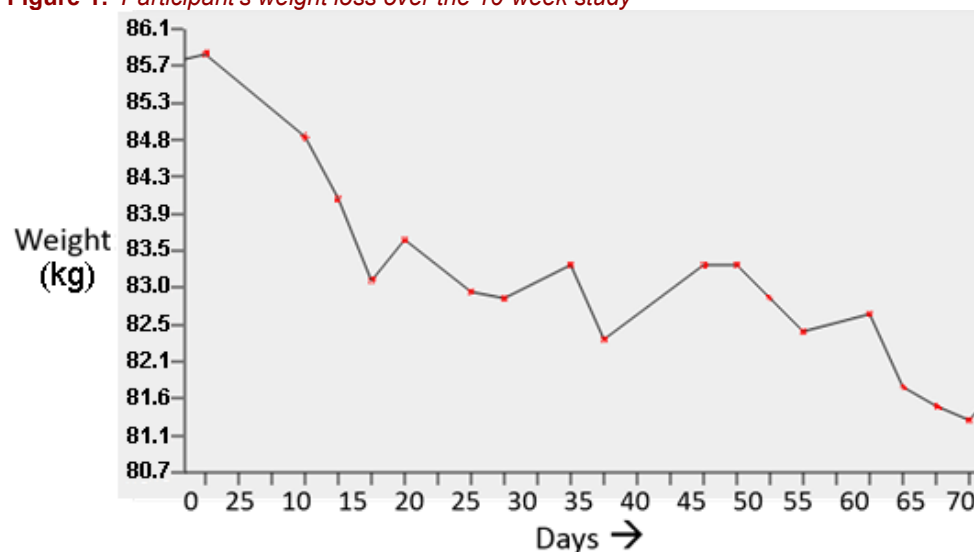
The subject of this case report lost 4.5 kg. over the 10-week intervention. She readily identified her distressing, displacement life situation sources and created action plans for each.

For example, she related, "My boss was the source of the issue. The reason why I was dreading something, was because of the way I was being treated by my boss. So, I had two options. I could either face my boss and talk to her about what was going on, or I could quit the job. I actually tried to talk to her and she just wasn't very receptive. So, I left my job. I quit, and I found another job. My overeating ceased and my weight began to drop, because I dealt with the source of the issue."

The participant identified several other displacement sources in addition to her job: "I think that really the sources I have is like finances, school, and moving. I actually sat down and wrote down my plans, like my plan for moving, my plan for getting money, and my plan for paying off all this debt that I'm about to accumulate. All the mindless urges and the snacking and stuff like that really just went away. I just wrote it down. My action plan for finances and stuff like that, and then they disappeared. No more eating urges. I mean, I'm definitely going to continue to write down my action plans, because now that I've said that out loud, it makes a lot more sense."

Figure 1 shows participant's weight loss over the 10-week study.

Figure 1: *Participant's weight loss over the 10-week study*



DISCUSSION

The displacement mechanism would seem to explain why individuals in stressful situations feel pushed to overeat or binge and afterwards feel regret. Identifying untenable life situations and implementing action plans to deal with each one appears to quell eating urges and facilitate weight loss.

CONCLUSIONS

This case report suggests that an intervention for obesity (eating addiction?), based on the displacement mechanism, is feasible and may help to produce weight loss. It would seem to provide subjects with believable hope that they can curb their overeating without struggling or relying on willpower. A pilot study is planned.

REFERENCES

1. Pretlow RA (2011) Addiction to highly pleasurable food as a cause of the childhood obesity epidemic: A qualitative internet study. *Eating Disorders* 19:295-307.
2. Arnow B, Kenardy J, Agra S, (1992), Binge eating among the obese: A descriptive study. *Journal of Behavioral Medicine*, Volume 15, Issue 2, pp 155–1701.
3. Anselme P (2008), Abnormal patterns of displacement activities: A review and reinterpretation, *Behavioural Processes*, 79 48–58
4. Pretlow, R, Stock, C, Roeger, L, Allison, S. (2020). Treatment of the sensory and motor components of urges to eat (eating addiction?): a mobile-health pilot study for obesity in young people. *Eat Weight Disord* (published online Jan. 2020).
5. Zeigler H (1964), Displacement activity and motivational theory: a case study in the history of ethology. *Psychological Bulletin*, 61:5, 362-376.