


# The weight balancing act and allostasis: Commentary on the Homeostatic Theory of Obesity

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## Abstract

The current article provides commentary on the Homeostatic Theory of Obesity and associated Circle of Discontent. A strength of this theory is that it points to the requirement for multiple avenues of societal change, largely through policy and regulation. The current authors suggest consideration of allostasis, coping style and habituation in addition to the existing model. Incorporation of these into the Homeostatic Theory of Obesity may help to expand its explanatory power and associated avenues of intervention. Whatever else is done, it is likely that to meaningfully address the epidemic of obesity and associated chronic disease will require policy and regulation as well as targeted behavioural strategies aiming to reduce allostatic load.

## Keywords

allostasis, behaviour change, coping, habits, homeostasis, obesity

Obesity results from an imbalance of energy needs, and accordingly homeostasis, which describes the physiological maintenance of steady state or ‘set point’ seems an appropriate framework by which to think about obesity (Harris, 1990). Set-points have been described in relation to protein intake (Fernstrom and Fernstrom, 2001), activity (Gomersall et al., 2013) and food intake (Schwartz et al., 2000) and fat mass (Mauer et al., 2001). The concept of set-points is, however, over-simplistic because, at least over time, weight gain is accommodated, whereas at any point in time, a diet-induced decrease in fat mass is almost inevitably regained over time, even when there is an apparent disadvantage from a health perspective (Maclean et al., 2011). Homeostasis may be selectively defended for some aspects of physiology to the detriment of others and also be overlaid on a background of plasticity. This is more akin to an allostatic than a homeostatic system. Allostasis is the active deviation from homeostasis for adaptive purposes (Cacioppo and Bernston, 2007).

In a recent article, David Marks (2015) proposes a theoretical perspective on drivers and potential treatments for obesity using homeostatic principles to describe relationships between key psychological variables. In health psychology, homeostasis has been used to

describe the link between physiological and psychological function: for example, the influence of the mind over immune function (Cacioppo and Bernston, 2007) and the maintenance of subjective well-being (Cummins et al., 2002). Marks applies homeostasis to the psychological drivers of obesity.

At the core of the Homeostatic Theory of Obesity, as proposed by Marks, is the Circle of Discontent (COD), which includes the combination of four variables: energy-dense food/beverage consumption, body dissatisfaction, negative affect and overweight/obesity and reciprocal associations between them. After description of the key pathways between these, Marks proposed effective ways to combat obesity using this framework. Some of Mark’s suggestions require legislative change targeting adjustment of societal norms (stigmatisation of obese people and cultural ideals of thinness) or specific dietary behaviours

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(increasing access to plant-based diets and reducing consumption of energy-dense foods and beverages).

The strength of Marks' framework is that it points to the requirement for multiple avenues of societal change (Gortmaker et al., 2011). We concur that social norms have pervasive effects on eating behaviour (Brindal et al., 2015), but changing norms have proven challenging (e.g. changing excessive drinking in college campuses; Cameron and Campo, 2006). Considered policy change with legislative backing provides an alternative approach (De Groot and Schuitema, 2012) but requires political will and courage.

As an alternative, we propose that COD might be considered in the context of allostasis and the Conservation of Resource Theory, which was developed to describe the way that people cope with stresses. It suggests that when under stress, people will use their resources in order to cope and return to regular, stress-free function, or homeostasis. These resources can be psychological (e.g. self-compassion), social (e.g. friend and family) and more tangible (e.g. money, time) (Hobfoll, 2002). Allostatic load may impact all of these resources – particularly in the face of prolonged or intense challenges. Psychological processes that describe this include self-regulation failure and ego-depletion (Baumeister, 2003). Dallman (2010) draws on similar concepts to describe how stress may result in obesity. These theories are important because focussing on potential buffers and catalysts for the COD may lead to alternative avenues for obesity intervention. Therefore, malleable individual factors that buffer against the deleterious effects of a COD represent an excellent focus on intervention.

Adaptive coping strategies are potentially an excellent and malleable way to reduce allostatic load (or even prevent homeostatic imbalance in the first place). Possessing and utilising appropriate coping strategies is identified as a key mediator of allostatic load in response to stress (Lazarus and Folkman, 1987). For example, avoiding problems is generally thought an unproductive coping style, but in the correct context (one where the situation is unchangeable), it can be highly productive. Yet, consistently avoiding a problem may act to increase the allostatic load on an individual, even to the point that it affects their health (DeLongis et al., 1988). In the context of obesity, the effects of stigmatisation have been associated with greater distress in the presence of certain coping styles (Myers and Rosen, 1999). Furthermore, normal-weight controls have shown more engaged coping styles than obese people regardless of whether they are seeking treatment (Fitzgibbon et al., 1993). This would suggest that coping style could be an important mediator of the COD and therefore a good target for intervention.

Finally, as the Homeostatic Theory of Obesity evolves, it will be interesting to see the role of habituation in the processes described. Habits are an integral part of behaviour and the pervasiveness of habits suggests the potential of homeostatic set-points for a multitude of behaviours

(Verplanken and Aarts, 1999; Verplanken et al., 1998). Raup (1925) provides an early and insightful overview that ties together concepts of homeostasis (which he calls equilibrium) and habit formation in the context of behavioural complacency. Weight gain can be insidious and small changes over time can result in large weight changes over prolonged periods; likewise small habitual changes could result in weight loss. The ability to adjust unhealthy behavioural set-points to healthy ones that are enacted habitually is a 'philosopher's stone' in lifestyle intervention (Orbell and Verplanken, 2010; Ouellette and Wood, 1998). Incorporation of habits into the Homeostatic Theory of Obesity may provide interesting future directions in terms of understanding how people become 'complacent' with weight despite concurrent body dissatisfaction (Rand and Resnick, 2000). Ultimately, however, whatever else is done, it is likely that to meaningfully address the epidemic of obesity and associated chronic disease will require policy and regulation as well as targeted behavioural strategies aiming to reduce allostatic load.

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### References

- Baumeister RF (2003) Ego depletion and self-regulation failure: A resource model of self-control. *Alcoholism, Clinical and Experimental Research* 27: 281–284.
- Brindal E, Wilson C, Mohr P, et al. (2015) Eating in groups: Do multiple social influences affect intake in a fast-food restaurant? *Journal of Health Psychology* 20: 483–489.
- Cacioppo JT and Bernston GG (2007) The brain, homeostasis, and health. In: Friedman HS and Cohen Silver R (eds) *Foundations of Health Psychology*. New York: Oxford University Press, pp. 73–91.
- Cameron KA and Campo S (2006) Stepping back from social norms campaigns: Comparing normative influences to other predictors of health behaviors. *Health Communication* 20: 277–288.
- Cummins RA, Gullone E and Lau ALD (2002) A model of subjective well-being homeostasis: The role of personality. In: Gullone E and Cummins RA (eds) *The Universality of Subjective Wellbeing Indicators: A Multi-Disciplinary and Multi-National Perspective*. Weteringschans: Kluwer Academic Publishers, pp. 7–46.
- Dallman MF (2010) Stress-induced obesity and the emotional nervous system. *Trends in Endocrinology Metabolism* 21: 159–165.
- De Groot JIM and Schuitema G (2012) How to make the unpopular popular? Policy characteristics, social norms and the acceptability of environmental policies. *Environmental Science & Policy* 19–20: 100–107.
- DeLongis A, Folkman S and Lazarus RS (1988) The impact of daily stress on health and mood – Psychological and social resources as mediators. *Journal of Personality and Social Psychology* 54: 486–495.

- Fernstrom JD and Fernstrom MH (2001) Monoamines and protein intake: Are control mechanisms designed to monitor a threshold intake or a set point? *Nutrition Review* 59: S60–S65; discussion S66–S68.
- Fitzgibbon ML, Stolley MR and Kirschenbaum DS (1993) Obese people who seek treatment have different characteristics than those who do not seek treatment. *Health Psychology* 12: 342–345.
- Gomersall SR, Rowlands AV, English C, et al. (2013) The ActivityStat hypothesis: The concept, the evidence and the methodologies. *Sports Medicine* 43: 135–149.
- Gortmaker SL, Swinburn BA, Levy D, et al. (2011) Changing the future of obesity: Science, policy, and action. *The Lancet* 378: 838–847.
- Harris RB (1990) Role of set-point theory in regulation of body weight. *FASEB Journal* 4: 3310–3318.
- Hobfoll SE (2002) Social and psychological resources and adaptation. *Review of General Psychology* 6: 307–324.
- Lazarus RS and Folkman S (1987) Transactional theory and research on emotions and coping. *European Journal of Personality* 1: 141–169.
- Maclean PS, Bergouignan A, Cornier MA, et al. (2011) Biology's response to dieting: The impetus for weight regain. *American Journal of Physiology – Regulatory, Integrative and Comparative Physiology* 301: R581–R600.
- Marks DF (2015) Homeostatic Theory of Obesity. *Health Psychology Open* 2. DOI: 10.1177/2055102915590692.
- Mauer MM, Harris RB and Bartness TJ (2001) The regulation of total body fat: Lessons learned from lipectomy studies. *Neuroscience and Biobehavioral Reviews* 25: 15–28.
- Myers A and Rosen JC (1999) Obesity stigmatization and coping: Relation to mental health symptoms, body image, and self-esteem. *International Journal of Obesity* 23: 221–230.
- Orbell S and Verplanken B (2010) The automatic component of habit in health behavior: Habit as cue-contingent automaticity. *Health Psychology* 29: 374–383.
- Ouellette JA and Wood W (1998) Habit and intention in everyday life: The multiple processes by which past behavior predicts future behavior. *Psychological Bulletin* 124: 54–74.
- Rand CSW and Resnick JL (2000) The 'good enough' body size as judged by people of varying age and weight. *Obesity Research* 8: 309–316.
- Raup RB (1925) *Complacency: The Foundation of Human Behavior*. New York: The Macmillan Company.
- Schwartz MW, Woods SC, Porte D Jr, et al. (2000) Central nervous system control of food intake. *Nature* 404: 661–671.
- Verplanken B, Aarts H, van Knippenberg A, et al. (1998) Habit versus planned behaviour: A field experiment. *British Journal of Social Psychology* 37(Pt 1): 111–128.
- Verplanken B and Aarts H (1999) Habit, attitude, and planned behaviour: Is habit an empty construct or an interesting case of goal-directed automaticity. *European Review of Social Psychology* 10: 101–134.