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 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...
(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 focusing 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 changeable), 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 persuasiveness 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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