

# How to Fuel a Fitter World

## Obesity Prevention for the Technological Generation

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### current trends

Obesity refers to excessive amounts of body fat, while being overweight refers to having excess body fat relative to height. Obesity has been identified as a “world wide epidemic” with the Middle East, North American, Central and Eastern Europe displaying the highest prevalence rates. The main cause of this gain in weight is attributed to a caloric imbalance, as children and adults are consuming calories and are not expending them.

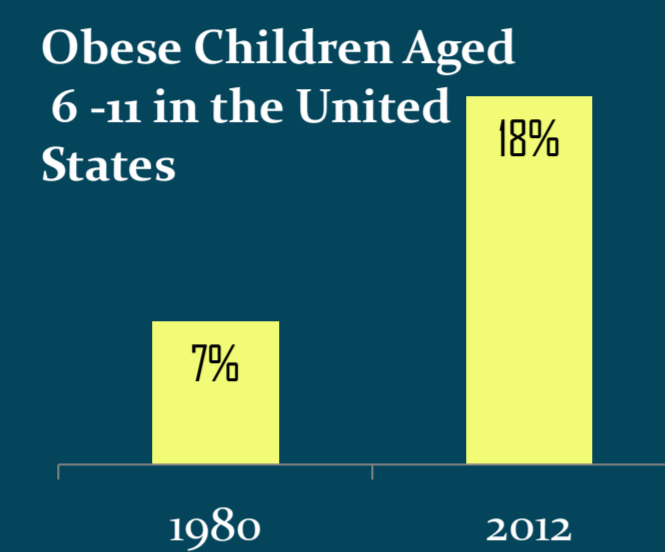


Figure 1 Obese Children Aged 6-11 in the United States. Retrieved from <http://www.cdc.gov/obesity/data/childhood.html>.

### Entertainment

Current trends in entertainment choices logically could be associated with weight gain as many new forms involve sedentary behaviour. When high levels of television, video game and computer use displaced active behaviours a correlation was found to increased weight refer to Figure 2 .

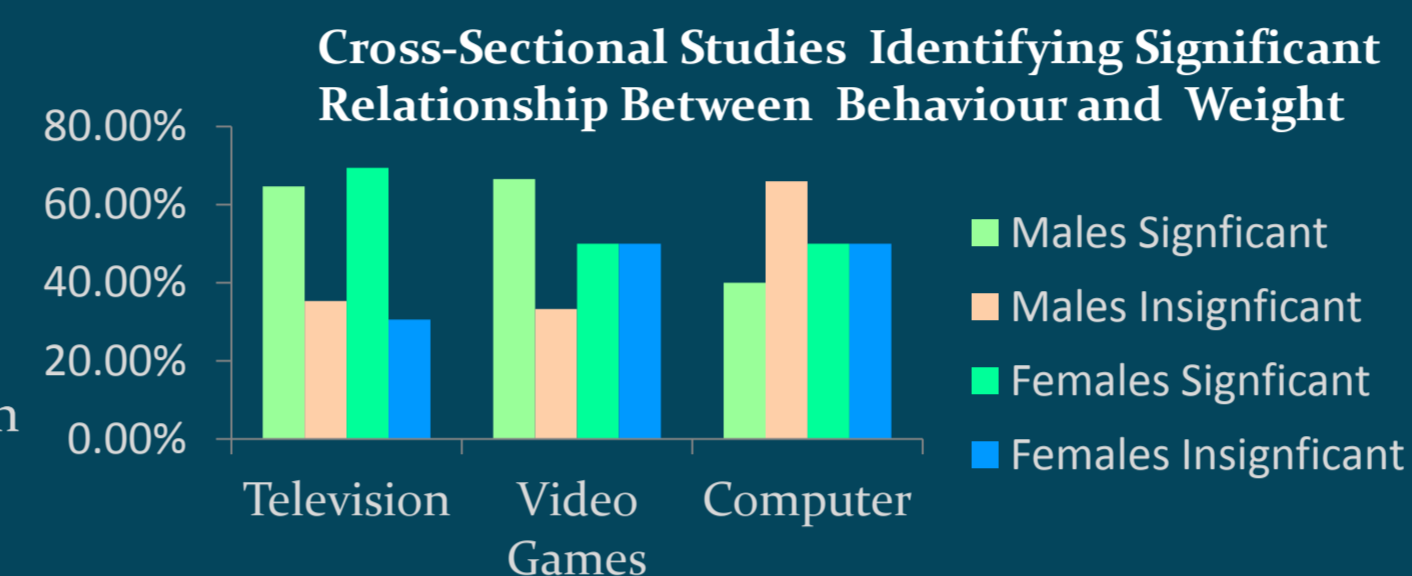


Figure 2 Cross-sectional studies in which each type of behaviour was individually registered. Proportion of studies with a significant relationship between sedentary behaviour and overweight. Copyright 2008 By Elsevier.

### Emotional Deficits

Psychological unevenness and cognitive deficits such as mood disruptions, executive function control are suggested to impact weight gain and impair weight loss attempts . Neurological studies focusing on obese individual’s responses identify greater activation in the reward pathways during anticipation of food but reduced responses during consumption

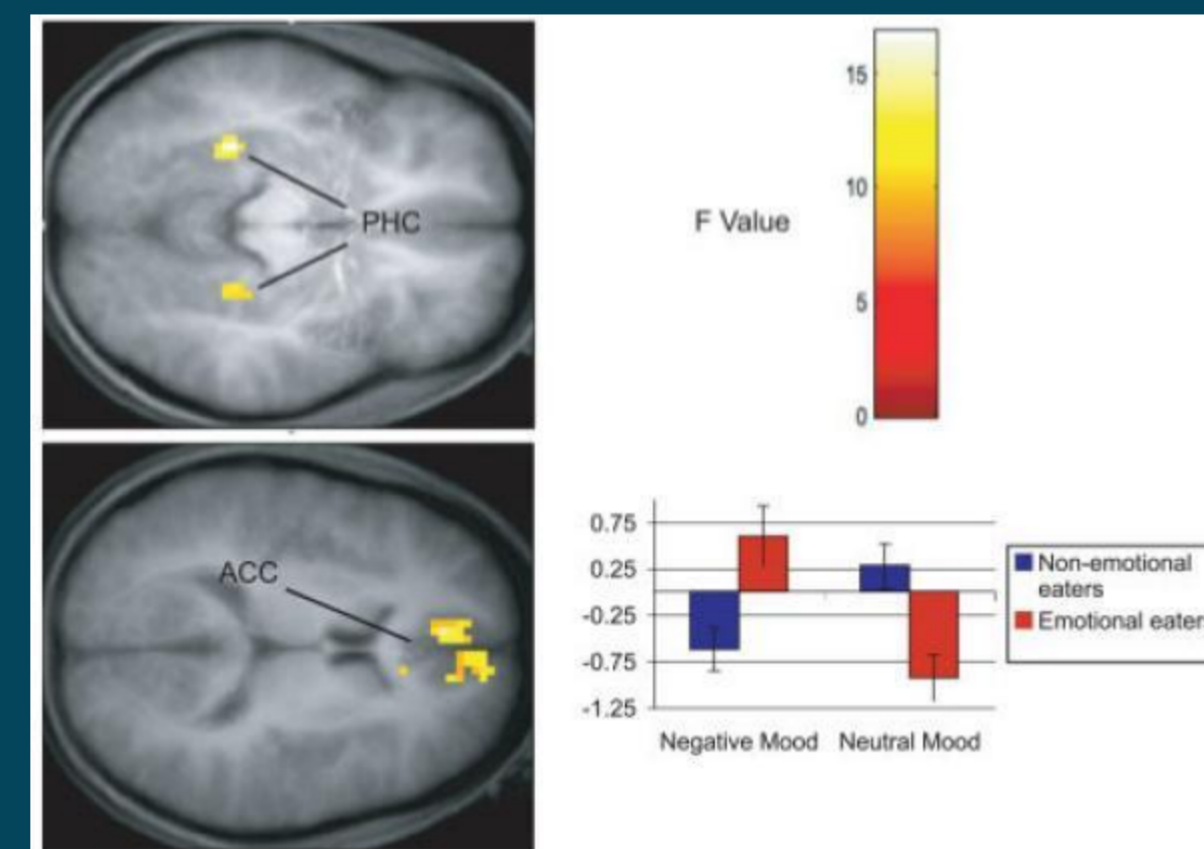


Figure 3 Results from ANOVA models of anticipatory food reward. The color bar represents the F values representative for both figures. Axial sections of increased activation bilaterally in the anterior cingulate cortex (ACC) and parahippocampal gyrus (PHC) in response to anticipated receipt of chocolate versus tasteless control solution in emotional eaters during a negative mood state compared with nonemotional eaters in the negative mood and emotional eaters during a neutral mood. The bar graph represents relative activation in the left parahippocampal gyrus in response to anticipatory reward. Results from other regions followed the same overall pattern of activation. Copyright 2009 NCBI

which may cause overeating as a means to reach those expected high levels of reward. This is linked to depression as these results were found in individuals only during negative affect states (Figure 3). Psychological distress and obesity become intrinsically linked due to negative stereotypes within many cultures.

### Advertising

Food based advertising has been linked to the increase of obesity in youths, with the food industry targeting children and adolescents as audiences. Studies regarding the emotional reward pathways indicate that leptin signaling correlated to high responsiveness in the reward centres of the brain during exposure to high calorie food contribute to the response of overeating in adolescents, (Jastreboff et al, 2014).



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### the idea

Technology is becoming ever more prevalent in teens and children's lives, 78% of teens now have a cell phone 9 out of 10 teens have access to a computer.



To actively encourage fitness in youth we must use a strong existing motivator: technology. This can be accomplished by connecting the charging of a specific loved electronic like a phone or a laptop directly to an exercising machine.

Essentially the machine will act as the primary source of battery power for the various electronics. With variable machines used as “fuel” extending to heart rate monitors for workout monitoring. The target audience for these types of machines are those children and adolescents that have no interest in sports or other active pastimes, and that are highly invested in their technological entertainment. These children are likely those that maintain sedentary lifestyles and as such are more likely to be impacted by obesity.



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This solution must be used in conjunction with other strategies such as nutritional support and psychological counselling, to provide a well rounded basis for the children in question.

### underlying factors

#### Genetics

70% of obesity has been attributed to genetic predispositions

#### Nutrition

Experts cite nutrition and health choices as being connected to the rise of obesity. schools with nutritional controls have been shown to be able to control obesity growth. Primary care providers highlight nutrition as an important component of change for people facing potential obesity

#### Exercise

A literature review of 53 articles conducted by the Government Accountability Office [GOA] in the U.S. draws the conclusion that, “Physical activity would remain as the leading strategy, with nutrition strategies being important in the rankings, though ranked lower” .The evidence for physical interventions, movement and exercise has been supported in the literature.

A study involving a yearlong intervention of physical fitness in youth showed significant improvement in many health factors associated to obesity (Blüher et al.,2014). This evidence suggests that exercise and physical activity must be in forefront of most programs designed to combat obesity rates, as it is a simple method that produces results.



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### conclusion

The epidemic of obesity is a reality that our society must face, and much research has been accomplished into addressing this problem. Many underlying causes have been identified as playing various roles in the obesity problem, throughout which the clearest and most available solution is exercise. The youth is in need of strong motivation and programs outlined to be addressed to them. Methods that are developed must be modern and related to the current trends of youth; technology is a permanent staple of their lives and must be treated as such. The solution of exercise powered electronics seems extremely viable, and a strong solution is necessary in the face of such a towering problem.