CHAPTER 2: CAUSES OF OBESITY

Part 5: The Environmental Influence

References:

1. **Peter G. Kopelman, Ian D. Caterson, William H. Dietz - Clinical Obesity in Adults and Children 4e-Wiley-Blackwell (2022)**
2. **Sharon Akabas, Sally Ann Lederman, Barbara J. Moore - Textbook of obesity_ Biological, psychological and cultural influences-Wiley-Blackwell (2012)**

Introduction

- Regarding, our living environment, simply put: "our health is a function of where we live"

- Obesity should be viewed as arising from "normal physiology within a pathological environment"

- The objective is to decipher how exposures within a given place of living can impact energy- balance- related behaviors → weight gain

Introduction

- Regarding our food environment, most of us are largely unaware of what influences how much we eat.

- People usually assume that determinants are: how hungry they are, how much they like the food, and what mood they are in

- Understanding drivers of consumption has immediate implications for nutrition education

Outline

We will look at two levels of the 'Environment'

1. The Living Environments & Obesity

2. The Food & Eating Environments

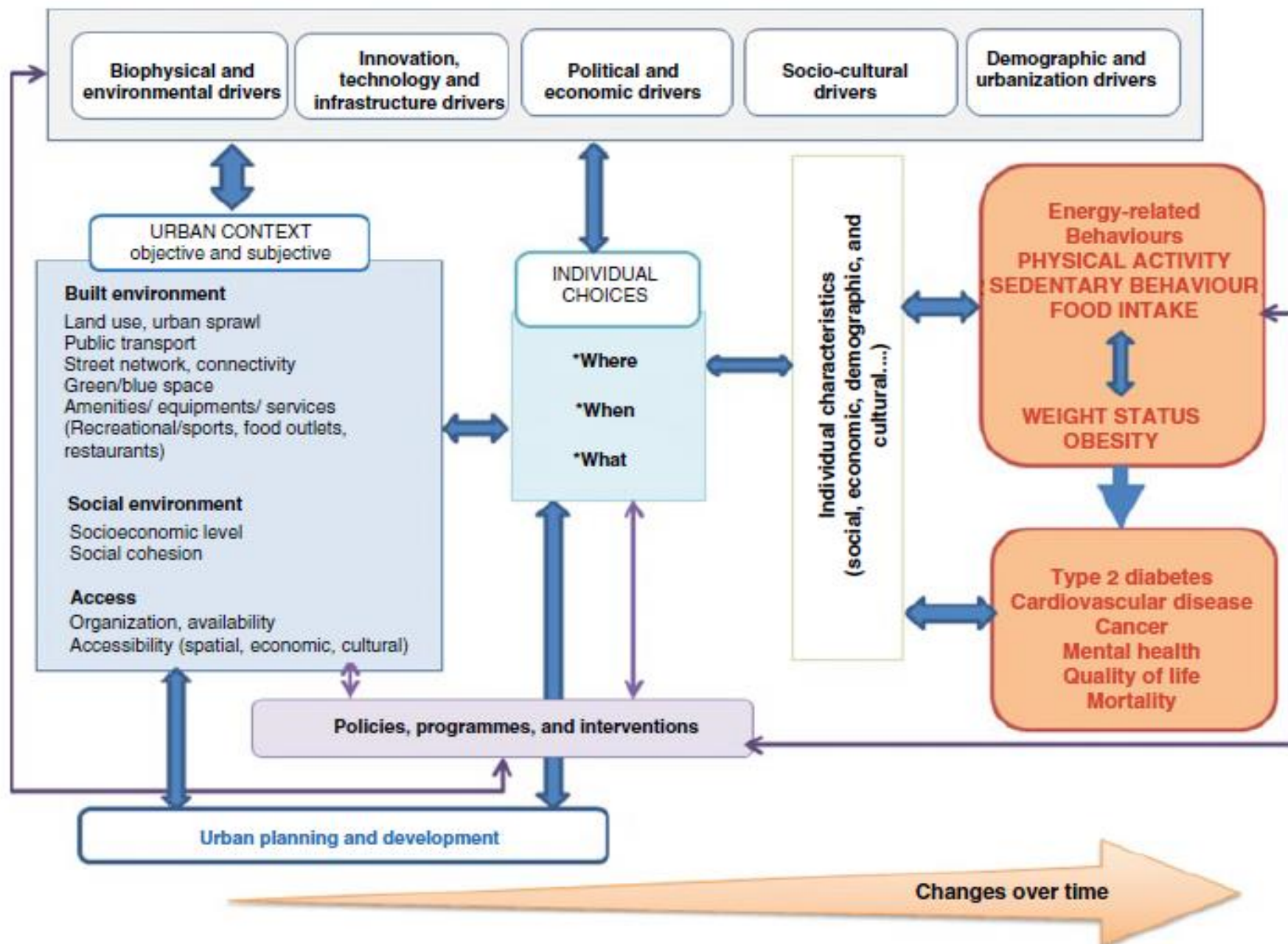# Part 1: The Living Environment & Obesity

Framework of living environments, energy- related behaviors, and obesity

- See figure in the next slide

- Discussion:

How do various environmental and social factors shape individual choices and influence energy-related behaviors?

Biophysical and environmental drivers | Innovation, technology and infrastructure drivers | Political and economic drivers | Socio-cultural drivers | Demographic and urbanization drivers

URBAN CONTEXT
objective and subjective

Built environment
Land use, urban sprawl
Public transport
Street network, connectivity
Green/blue space
Amenities/ equipments/ services
(Recreational/sports, food outlets, restaurants)

Social environment
Socioeconomic level
Social cohesion

Access
Organization, availability
Accessibility (spatial, economic, cultural)

INDIVIDUAL CHOICES

*Where

*When

*What

Individual characteristics (social, economic, demographic, and cultural...)

Energy-related Behaviours
PHYSICAL ACTIVITY
SEDENTARY BEHAVIOUR
FOOD INTAKE

WEIGHT STATUS OBESITY

Type 2 diabetes
Cardiovascular disease
Cancer
Mental health
Quality of life
Mortality

Policies, programmes, and interventions

Urban planning and development

Changes over time

The Urban Context encompasses:

1.   The built environment

All man-made features: buildings, transport infrastructure, green space, blue space, recreational facilities, and food amenities.

Example #1: if a neighborhood has a lot of recreational areas and is walkable, residents are more likely to be physically active.

Example #2: easy access to healthy food options can positively influence dietary choices (in contrast to **food deserts**)

Food Deserts

- Food deserts are areas where people have limited access to a variety of healthy and affordable food

The Urban Context encompasses:

2. The social environment

The social environment may moderate the influence of the built environment on health-related behaviors and health outcomes

Social environment factors include things like socioeconomic status and social cohesion

Example: High-income vs. low-income areas

Example: How connected a community is and participating in group activities

https://partnershipph.org/gallery/story/greenfield-walking-group/

The Urban Context encompasses:

- Access

Having these resources is important, but they should be made accessible in terms of:

- Cost
- Location
- Cultural relevance.

Policies, Programs, and Interventions

- Creating supportive environments that promote healthy choices often requires coordinated actions from policymakers and urban planners

- These are essential to overcome barriers in our environments

Drivers

- Five "drivers" influence the urban environment and obesity:

1. Biophysical and Environmental Drivers

- Natural environmental factors (climate, green or blue spaces)

- **Example:** Areas rich in natural resources may invest in maintaining green spaces → encourage outdoor activities

Drivers

2. Innovation, Technology, and Infrastructure Drivers

- Advancements in technology and the availability of infrastructure (e.g. transportation systems). It includes everything from internet access to public transport options and walkability.

- **Example #1**: Neighborhoods with well-developed walkable streets encourage walking and reduce reliance on cars.

- **Example #2:** Online food delivery apps has affected food access (but also physical activity patterns?)

Drivers

- **3. Political and Economic Drivers**

- **Explanation**: Policies, economic systems, and political decisions that shape the built environment. Taxes and public health regulations for example.

- **Example**: Countries with robust public health policies, programs may incentivize healthier environments by supporting access to affordable, healthy food and recreational spaces.

Drivers

- **4. Socio-Cultural Drivers**

- **Explanation**: Norms, beliefs, traditions, and lifestyle habits that influence health behaviors (food, physical activity, and body image)

- **Example**: In some cultures, larger body size may be seen as a sign of prosperity, affecting societal attitudes toward weight and body image.

Drivers

5. Demographic and Urbanization Drivers

- Population demographics (like age, gender, income level) and the impact of urbanization.

- **Example**: High-density urban areas might have better access to amenities like gyms or grocery stores but may also lead to overcrowding, pollution, or limited green space.

Measuring attributes of the built environment

- A variety of methods have been used to assess built environment characteristics of interest.

- **Subjective** methods: Based on the perceptions by individual residents of features of their neighborhood environment through interviews/questionnaires.

- **Objective** methods: Relies on pre-existing inventory databases and environmental audits. Audits consist of either sending trained observers into the field with checklists or the use of remote assessment based on free geospatial services (Google Street View) to document specific aspects of the built environment.

Measuring attributes of the built environment

- Items that should be assessd include:

    1. **Presence of walking- related items** sidewalks & their condition, pedestrian crossing available, streetlights

    2. **Presence of cycling related items** bicycle lanes, speed limit in street segment, obstacles present on bicycle lanes

    3. **Presence of public transport items**

    4. **Aesthetics** Green/water area, gardens, graffiti, litter

    5. **Land use mix** Type of residential buildings

    6. **Presence of food stores** Supermaket, Local food shop, Convenience store/small grocery store

    7. **Presence of restaurants** Fast food restaurant, Take away restaurant

Tools

- Neighborhood Environment Walkability Scale:

https://cancercontrol.cancer.gov/sites/default/files/2020-06/news.pdf

Example of manipulating the built environment

- In 2017:

  - London Mayor strategy: fast food outlets should not be allowed to open **within 400m** of schools.

  - Research shows that people living closest to the largest number of takeaway outlets were more than **twice as likely** to be obese than of normal weight.

  https://www.bbc.com/news/health-42172579

Part 2: The Food & Eating Environments

Definitions

- **Eating environment**: Ambient factors independent of food, such as atmosphere, the effort of obtaining food, the time of day, the social interactions that occur, and the distractions that may be taking place

- **Food environment**: Factors that directly relate to the way food is provided or presented, such as its structure, package or portion size, and how it is served

Environmental Influences on Over-serving and Overeating
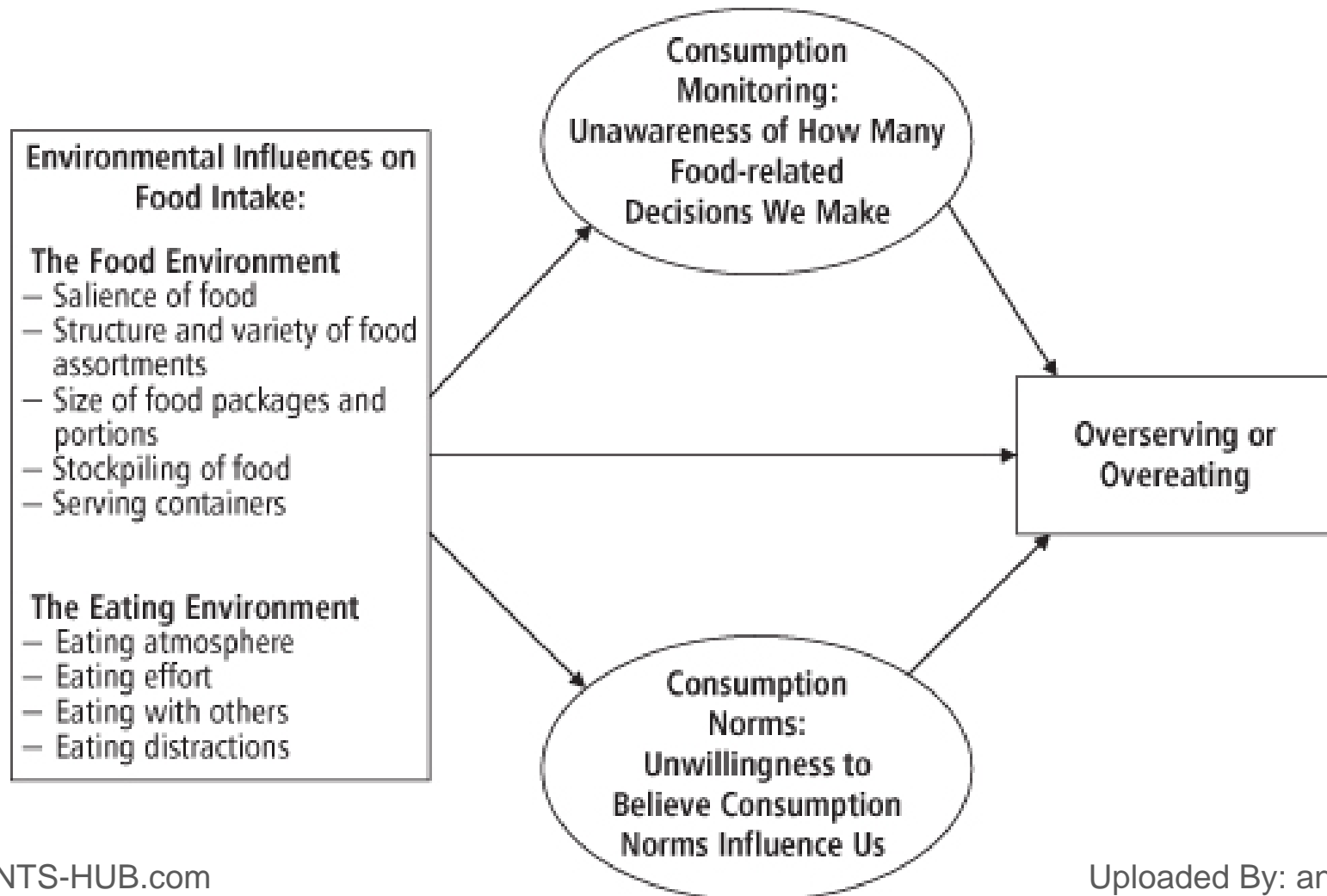
1. The Food Environment

- Food-related environmental factors that influence consumption volume, include:

1) Salience

2) Structure

3) Size

4) Whether it is stockpiled

5) How it is served.

Salient Food Promotes Salient Hunger

- Effect on our visual and olfactory senses: The mere presence of food can prompt unplanned consumption → Simply seeing or smelling a favorable food stimulate salivation and increase the release of dopamine.

- This serves as a constant consumption reminder.

- The effect of these cues can be particularly strong with unrestrained eaters.

- Suggestions to control this factor?

Structure and Perceived Variety Can Drive Consumption

- Increases in perceived variety can make a person believe they will enjoy the assortment more, or it can also suggest an appropriate amount to consume (the consumption norm) in a particular situation

Suggestions to control this factor?

# The Size of Packages and Portions Suggest Consumption Norms

- The size of a package & portions can increase consumption

- Portion size first begins to influence children between 3 and 5 years of age. The tendency for children to let portion size influence their consumption volume has been referred to as the "clean-your-plate" phenomenon or the completion principle

- Large packages and portions → suggest larger consumption norms. This implicitly suggest what is "normal" or "appropriate" amount to consume.

- It gives the liberty to consume past the point where one might have stopped with a smaller supply.

Stockpiled Food Is Quickly Consumed

- The presence of large stockpiles of food products can make those products more visible, which can stimulate consumption frequency.

Figure 4
STUDY 2: HOW STOCKPILING AND SALIENCE INFLUENCE THE CONSUMPTION QUANTITY FOR HIGH- AND LOW-CONVENIENCE PRODUCTS
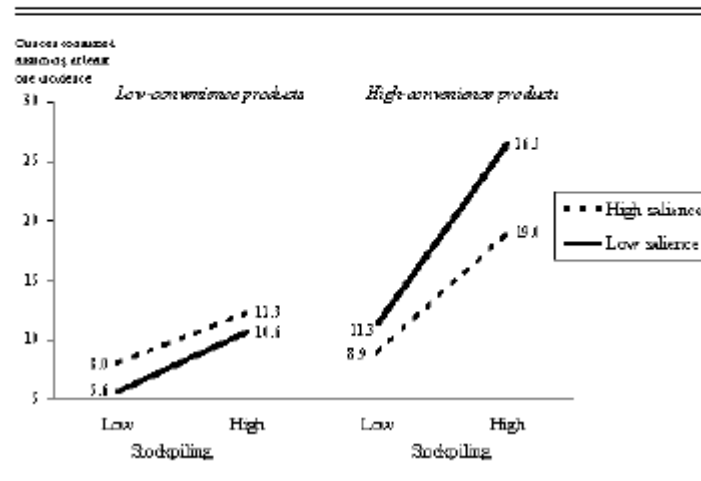
Serving Containers that Are Wide or Large Create Consumption Illusions

- Drinking glasses: Vertical–horizontal illusion.

- Size of plates and bowls?

  - Underestimation of the total amount on a larger plate because of its greater negative space

- Even if these perceptual cues are inaccurate, they offer cognitive shortcuts that can allow better serving behaviors with minimal cognitive effort.

- The effect of spoon size

2. The Eating Environment

- There are various consumption drivers in our environment, including:

1) eating atmospherics

2) eating effort

3) eating with others

4) eating distractions.

Atmospherics Influence Eating Duration

- Consider atmospherics, such as temperature, lighting, odor, and noise, that characterize the immediate eating environment. (When favorable → comfortable environment → increase time dedicated to eating)
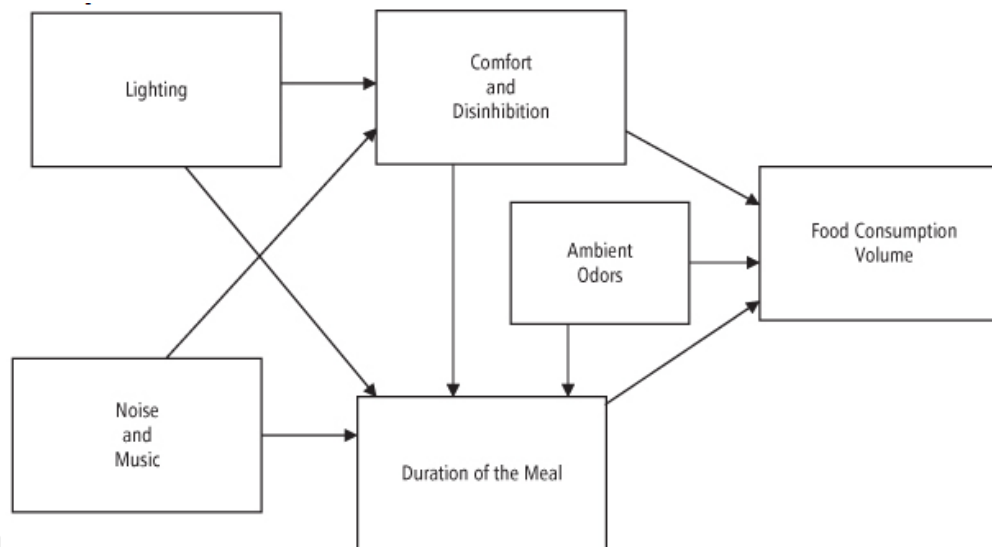
Increased Effort Decreases Consumption

- Ease, access, or convenience with which a food can be consumed and is one of the strongest influences on consumption

- Examples:
  - Repackaging foods in smaller containers increases subsequent opening effort and gives a person pause to reconsider.
  - Tempting foods that are stored in less convenient locations can be "too much trouble" to obtain and unnecessarily consume.
  - Leaving serving bowls and platters off the dinner table will decrease the amount consumed.

Socializing Influences Meal Duration and Consumption Norms

- Presence of other people influences consumption content & volume
- Example:
  - Eating with unfamiliar people can suppress food intake in situations where self-monitoring and self-awareness are high,
  - Eating with familiar people can extend meal times well beyond the duration of the same meal consumed alone

  This can reduce one's ability or motivation to monitor how much is consumed.

  These effects can be dramatic: De Castro has shown that meals eaten with one other person were 33% larger than those eaten alone, and increases of 47%, 58%, 69% 70%, 72%, and 96% have been associated with the presence of two, three, four, five, six, and seven or more people, respectively.

  Obese individuals can be particularly susceptible to these cues.

Distractions Can Initiate, Obscure, and Extend Consumption

- Distractions (reading or watching television) can increase consumption by initiating, obscuring, or extending consumption.

- They can initiate **script-related food consumption**.

- A "script": Cognitive construct we use to define our behavior in a certain context → We engage in feeding behavior we perceive as appropriate based on cues in our present context—whether or not one of these "cues" involves hunger is up to the individual.

- *Using situational context cues in lieu of hunger to regulate feeding behavior can obscure one's ability to monitor consumption and can extend the duration of a meal.*

- Additionally, they reduce one's ability to monitor consumption volume.

Distractions Can Initiate, Obscure, and Extend Consumption

- In a media-rich, food-rich environment, the consumption awareness of people who are distraction-prone suffers, and overeating often ensues.

- If obese individuals are indeed more distraction-prone than individuals of normal weight, then it follows that they will tend to consume more in a given distracting situation.

Key Points

1. Nearly everyone eats and overeats not only because of hunger, many environmental cues influence our decision.

2. Most people are may be influenced at a basic level of which they are not aware or which they do not monitor.

3. Understanding the contributing factors can be used to reduce overconsumption.

4. An important new area for environment/behavior research is the examination of how the environment could be altered to work for rather than against us.