Disclosure to Participants

- Notice of Requirements For Successful Completion:
  - Please refer to learning goals and objectives
  - Learners must attend the full activity and complete the evaluation in order to claim continuing education credit/hours

- Conflict of Interest (COI) and Financial Relationship Disclosures:
  - None

- Non-Endorsement of Products:
  - Accredited status does not imply endorsement by AADE, ANCC, ACPE or CDR of any commercial products displayed in conjunction with this educational activity

- Off-Label Use:
  - Participants will be notified by speakers of any product used for a purpose other than for which it was approved by the Food and Drug Administration.

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Adequate Nutrition Label Literacy May be Less Common Than You Think

Health Literacy

- Health Literacy - the ability to obtain, process, and understand basic information and services needed to make appropriate decisions regarding one's health (IOM National Academy of Medicine, 2004)
  - 90 million Americans are unable to adequately understand basic health information

Nutrition Literacy

- Obtain, process, and understand nutrition information to make diet-related decisions
  - "You need to understand how foods and nutrition affect your body. Food portions and food choices are important. Carbohydrates, fat, and protein need to be balanced to ensure blood sugar levels stay as stable as possible." - The Academy of Nutrition and Dietetics
  - "Healthy Eating is one of Seven Key Self-Care Behaviors: You should eat regular meals, think about the amount you eat and make food choices to help control your diabetes better and prevent other health problems." - AADE
Nutrition Literacy

- Is critical for managing DM
- DM increases in prevalence in later life
  - 30% of older adults have diabetes
- Older age is significantly related to limited health literacy
- But, we know little about nutrition literacy at any age, especially in later life

OVERVIEW

- Literacy in Context: Cognition across the lifespan
- Research on Nutrition Label Literacy
  - Front-of-Package (FOP) Symbols
  - Use of FOPs and Dietary Quality
  - Comprehension of FOPs
  - Nutrition Facts Panels (NFPs)
  - Use of Serving Size Information
  - Label Comparison Strategies
  - Improving Nutrition Label Literacy
  - Learning about Nutrition
  - Label Reading Skills

Dual Nature of Cognition in Adulthood

Nutrition Literacy Relies on Both Types of Basic Cognitive Abilities

- Working Memory (Fluid Abilities)
  - For computation and short-term storage of information
- Knowledge (Crystallized Abilities)
  - Vocabulary
  - Knowledge (general, cultural, world knowledge)
  - Domain specific knowledge (nutrition knowledge)

Nutrition Knowledge

- Nutrition knowledge is related to:
  - accurate perceptions of food healthiness (Crites & Aikman, 2005)
  - healthy food choices
  - dietary quality (Kried, 2005; Raguin & Golan, 2005; Wardle, Parmenter, & Waller, 2000)
- Nutrition knowledge may be more important when nutrition tasks are complex and challenging
- Understanding and adhering to a healthy diet becomes more complex in later life due to onset of diet-related chronic illnesses as well as age-related declines in fluid abilities

Nutrition Information on Food Labels does NOT look like this
Framework

Food Label Use

Nutrition Knowledge
Working Memory
Numeracy
Motivation

Attention to Nutrition Information on Food Labels
Comprehension of, and Memory for, Information
Food Choice
Dietary Intakes

Method

Eye Tracker (EyeLink, SR Research)

Front-of-Package Symbols (FOPs)

- FOPs are summary of the nutritional content of foods designed to make nutrition information quicker and easier to notice, understand, and use (IOM, 2011).
- Facts-up-Front (Nutrition Highlights, Nutrition at a Glance), are voluntarily used in the USA (promoted by the Grocery Manufacturers Association and the Food Marketing Institute).

Front-of-Package Symbols (FOPs)

- Participants (n=350) were generally healthy adults, ages 18-80; they compared two similar products (entrees or cereals) and indicated which they would prefer to purchase.
- We found that attention to FOPs was positively associated with dietary quality (24 hour dietary recall).
- Consistent with self-reported measures of use, objective measures show that FOPs are consulted as part of food choice, across age groups.

Front-of-Package Symbols (FOPs)

- Participants were asked to determine which of the two products is more healthful.
- Completed assessment of nutrition knowledge:
  - 25 items assessing diet-health relations, sources of nutrients, dietary recommendations.

Front-of-Package Symbols (FOPs)

- Findings showed that nutrition knowledge was positively associated with decision accuracy.
- Do consumers use FOPs to make accurate healthfulness decisions?
  - Not really. Across all ages, only product comparisons with large calorie differences showed performance levels above chance. Large differences in sugar and fiber were not detected; performance was at or below chance.
FOP Summary and Implications

- Consumers do look at FOPs when deciding which food to purchase.
- However, consumers' ability to use FOPs to make healthfulness decisions is not very high; they over rely on calorie information (and ignore other important information).
- Thus, even when nutrition information is simplified and prominently placed (i.e., FOPs), and is consulted by consumers, it is often misunderstood.
- Nutrition knowledge related to accuracy of healthfulness decision, suggesting a certain level of nutrition expertise may be needed to use FOPs accurately.

Serving Size Information on Nutrition Facts Panels (NFPs)

- Do consumers pay attention to servings per container? How accurately do they use serving size information to make healthfulness judgments?
- May be dependent on numeracy skills and some have argued that older have more difficulty with numeracy-dependent food label tasks.

Serving Size Information

- We pitted per serving information against per container information.
- Larger packages had more healthful per serving information, but were less healthful per package.
- Assessed attention and accuracy, as well as numeracy, and knowledge.
- Younger and older consumers compared two products to determine which was more healthful if they were to consume the entire package.

Serving Size Information

- Older adults were less accurate than younger adults.
- They also paid less attention to serving size information (servings per container, and serving size).
- Numeracy was positively associated with accuracy.

Serving Size Information

- Older adults' accuracy was dependent on attention:
  - They were less likely to pay attention to serving size information.
  - But, when they did, accuracy was excellent.

Strategies for Comparing Nutrient Information on NFPs
Strategy Types

- Participants compared NFPs for healthfulness
- We assessed two strategy types
  - Within-NFP Fixation Sequence
    - Complementary: trade-offs between nutrients in one product
  - Between-NFP Fixation Sequence
    - Noncompensatory: single nutrient comparisons between products
- Nutrition knowledge, motivation, and decision accuracy

Strategy

- Findings showed age differences in the effectiveness of each strategy type; older adults benefited from noncompensatory strategies
- Nutrition knowledge and motivation predicted accuracy across age groups

NFP Summary

- Knowledge, numeracy, and motivation are related to accurate use of NFPs
- Serving size information is not widely used among older adults, but when it is, accuracy is high
- Older adults who use noncompensatory strategies to compare nutrient levels of foods are more accurate than those who use compensatory strategies
- Implies that older adults may benefit from training on the importance of considering servings per container and nutrient-level goals (e.g., sugar) when using NFPs to compare foods

Improving Nutrition Literacy

- Learning about nutrition
  - Language processing
  - Prior knowledge
  - Motivation (Stage of change)
  - Working memory capacity (loaded reading span)
- Developing food label reading skills

Learning about Nutrition

- Prior levels of nutrition knowledge predicted learning directly and indirectly through motivation
- Motivation predicted learning indirectly through attention

Learning about Nutrition

- Nutrition knowledge predicted learning directly: through attention only
- Working memory predicted learning through attention only

Whole grains are packed with nutrients and dietary fiber. Whole grains play a key role in meeting the recommended daily intake of dietary fiber, which can help prevent heart disease, diabetes, and certain cancers. Whole grains are also a good source of vitamin B, iron, and magnesium, which are essential for maintaining nerve function and red blood cell production.

Vegetables are a clear winner when it comes to reducing cancer risk. Vegetables are nutrient-dense, meaning they deliver many vitamins, minerals, and phytochemicals, for relatively few calories. Though eating vegetables may not provide complete protection, certain fruits and vegetables may target specific cancers. To get the most benefits, include dark yellow-orange-red vegetables, such as sweet potatoes, carrots, and tomatoes, because these contain carotenoids, which are powerful antioxidants.

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Knowledge as a Protective Factor for Older Adults

- Older adults had higher nutrition knowledge scores than younger adults (Miller et al., 2010, 2011)
- Correlations between age and learning:

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Knowledge protects against greater declines in performance (Salthouse’s migration hypothesis)

Learning about Nutrition

- Memory for content and source of previously read nutrition information

Developing food label reading skills

- Research in cognitive psychology has shown that:
  - With repeated practice, skills can be developed to establishing new habits
  - Background knowledge and prior experience support new learning
- Training Study:
  - 60 young adults completed 3 blocks of nutrition label comparisons, with 24 comparisons in each block, and feedback after each comparison (correct/incorrect) and total points awarded after each block
  - Prior to the food label training:
    - reported how frequently they use food labels (never to always) as a measure of experience
    - completed one of two educational overviews

Training Study Findings

- Nutrition education supported accuracy
- Training was most effective for those with lower levels of food label experience
- Ability to identify more healthful foods increased among all groups except those in the nutrition education group who had substantial food label reading experience

Sample Tasks

- Select healthier option (n=24 per block)
- Locate Information (n=6)
Summary

- Individuals need to pay attention to a wider variety of nutrients on food labels, not just calories.
- They need to learn what a meaningful difference is on key nutrients and what isn’t (e.g., 112 vs 120mg of sodium).
- Consumers, particularly older consumers, need to learn to look at servings per container when making food choices.
- Nutrition knowledge is critical for nutrition literacy:
  - Supports attention to, and accurate use of, nutrition information on food labels.
  - Facilitates learning new nutrition information.
  - Supports the development of label reading skills.
  - In some cases, benefits increase in later life.

Future Directions

- What is the most effective way to teach individuals to use food labels to support new and improved dietary habits, those that are used, without great effort, in day-to-day food choices?
- Distinguish between the role of declarative (e.g., facts about nutrition and food labels) and procedural (e.g., how to select healthful foods) knowledge in healthful eating.
- The Mindless Route: Can automatically surrounding the use of nutrition information on food labels spill over to food choice in other contexts (e.g., non-packaged foods, eating away-from-home)?
- Tailor food label training to those with special dietary needs and health goals.

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