American Dietetic Association

RESEARCH

Research and Professional Briefs

Recall of Vegetable Eating Affects Future Predicted Enjoyment and Choice of Vegetables in British University Undergraduate Students

ERIC ROBINSON; JACKIE BLISSETT, PhD; SUZANNE HIGGS, PhD

ABSTRACT

Predictions about enjoyment of future experiences are influenced by recalling similar past experiences. However, little is known about the relationship between hedonic memories of past eating episodes and future eating behavior. We investigated recall of previous experiences of eating vegetables and the effect of recall on future predicted liking for and consumption of vegetables. British University undergraduate students were asked to retrieve memories of previous occasions when they ate vegetables and were asked to rate how enjoyable those experiences were (Study 1, n=54). The effect of different types of memory recall (including vegetable eating recall) and visualization of someone else eating vegetables (to control for priming effects) on predicted likelihood of choosing vegetables and predicted enjoyment of eating vegetables was examined (Study 2, n=95). Finally, the effect of recalling vegetable eating memories on actual food choice from a buffet was assessed (Study 3, n=63). It is reported that people recall positive memories of past vegetable consumption ($P<0.05$) and that reminding people of these experiences results in higher predicted future liking for vegetables ($P<0.05$) and choice of a larger portion size of vegetables ($P<0.05$) compared with recall of a personal nonfood memory, a nonvegetable food memory, or visualization of someone else enjoying eating vegetables (increase of approximately 70% in vegetable portion size compared to controls). The results suggest that recall of previous eating experiences could be a potential strategy for altering food choices.

J Am Diet Assoc. 2011;111:1543-1548.

E. Robinson is a doctoral candidate, J. Blissett is a senior lecturer in Psychology, and S. Higgs is a reader in Psychology, all with the School of Psychology, University of Birmingham, Edgbaston, Birmingham, UK.

Address correspondence to: Eric Robinson, School of Psychology, University of Birmingham, Edgbaston, Birmingham B15 2TT, UK. E-mail: exr888@bham.ac.uk

Manuscript accepted: May 20, 2011.

0002-8223/$36.00

doi: 10.1016/j.jada.2011.07.012

Consumption of vegetables is associated with reduced risk of developing cancer (1), cardiovascular diseases (2), stroke (3), and hypertension (4). Furthermore, due to their low energy content, substitution of vegetables into the diet also has benefits in weight control (5).

Because of the benefits of vegetable consumption, current UK Government recommendations suggest that people should consume at least five portions of fruit and vegetables per day (6). However, a significant proportion of individuals fail to consume the recommended amounts (6,7). Similar patterns have also been identified internationally (8). Therefore, novel approaches are required to encourage increased consumption of vegetables.

One factor that is associated with vegetable consumption is reported liking (9,10). However, when making choices about which foods to consume, our memories of how much we enjoyed eating a food are likely to be important because selection occurs in the absence of direct sensory contact with foods. Hence, remembered liking is likely to play a significant role in shaping food choices (11). Despite this, little is known about memory for previously eaten foods and how this might be related to subsequent food choice.

The aim of the experiments presented here was to examine the relationship between remembered enjoyment of vegetable eating, predictions about liking for vegetables, and vegetable consumption. The aim of Study 1 was to assess the hedonic content of a freely recalled memory of eating vegetables. Because there is evidence that future behaviors are related to remembered enjoyment of previous similar experiences (12), it was hypothesized that recalled enjoyment of vegetable eating might be positively related to frequency of vegetable consumption. Study 2 investigated whether reminding people of a previous experience of eating vegetables affects predicted likelihood of choosing and enjoying eating vegetables in the future. It was hypothesized that free recall of previous vegetable eating would enhance predictions of future liking and choice because participants would use positive memories of vegetable eating in making their predictions. Study 3 assessed whether recall of an enjoyable eating occasion affects actual food choice. The design was similar to Study 2, but carrots were used as the recalled food because they are commonly consumed in the United Kingdom and a pilot study indicated people recall positive memories of eating carrots. To examine the possibility that findings could be explained by a halo effect, whereby recalling any healthy food primes healthy choice partici-

pants, we included a control group who were asked to recall eating a fruit. PASW Statistics 18 (2009, SPSS Inc, Chicago, IL) was used for data analysis.

METHODS

Participant Recruitment

Participants were undergraduate students recruited from the School of Psychology research participation scheme at the University of Birmingham in the United Kingdom. Participation was in return for course credit via a scheme in which participants voluntarily sign up for participation in research studies as part of their research training. Advertisement was through an online portal in which participants signed up to time slots in advance of study participation. On arrival for their sessions all participants provided signed consent for participation in the research. Data were collected over a 2-year time period (2008-2010), and procedures and questionnaires were piloted on a small number of undergraduate students before data collection for each study to ensure clarity of instructions and materials. Participation in Study 1 did not prevent participation in later studies, although to reduce demand characteristics, participation in Study 2 was an exclusion criterion for Study 3. All study protocols and procedures were approved by the University of Birmingham Research Ethics Committee.

Study 1

Fifty-four psychology undergraduates participated. The study was advertised as a questionnaire study on food. The sample consisted of 38 women and 16 men with an average age of 22.0±2.9 years.

Measures

Vegetable Memory Recall. Participants' recall of vegetable eating was assessed using visual analogue scale ratings. For question one, participants were asked to "describe an instance in which you ate a serving of vegetables and rate how much you liked eating the vegetable serving" on a 10-cm visual analogue scale, with anchors (from left to right): "strongly disliked" and "strongly liked." A filler question asking about consumption of a starchy food was also included (question two). Participants were asked to "describe an instance in which you ate a serving of pasta, rice, or potato and rate how much you liked the serving" using the same scale as in question one. For question three and question four participants were instructed to describe "the most enjoyable" and "least enjoyable" instances in which they ate a serving of vegetables and rate for liking, using the same scale described above. To minimize order effects, question three and question four were counterbalanced.

Vegetable Consumption Measure. To assess self-reported vegetable intake, we instructed participants to recall all food eaten during the previous day. Our measure was based on previous work using self-report memory measures that has indicated that individuals have accurate recall of eating episodes up to 24 hours later (13). Participants were asked to recall all of the previous day's eating episodes. The instructions were: "In this section you are asked to remember each eating episode (each time you ate) yesterday, from waking up to going to sleep. An eating episode includes any food eaten, which includes small snacks and main meals. You are instructed to try and mentally revisit each eating episode in order, by starting with waking up and working your way through the day and provide as much detail as possible. Please include all food items consumed during each episode. Under the heading 'Portion size' please estimate the amount of each food eaten in the episode."

Participants were provided with boxes in which to enter information concerning eating episodes during the previous day. The prompts were: "What time did you eat? Where did you eat? What did you eat? Portion size." Unless asked the researcher did not give the participant a prompt for portion size. If participants were unsure, the researcher instructed them to estimate using a measuring unit they were familiar with (ie, a cup, half a cup). To assess intake, each unique serving of vegetables recalled was classed as one portion.

Procedure

Participants were tested individually and completed the demographic measures followed by the vegetable memory recall questions and vegetable consumption measure in that order. Weight was measured in kilograms using a set of digital electronic scales (accurate to 0.1 kg) and height was measured in metres using a stadiometer. Participants were then thanked for their time and debriefed.

Statistical Design

Student *t* tests were used to compare the hedonic rating of the freely recalled memory with the hedonic rating of the most enjoyable memory and the least enjoyable memory. The relationship between the enjoyment rating of the freely recalled vegetable eating memory and the measure of habitual vegetable consumption was assessed by correlation.

Study 2

Ninety five psychology undergraduates (66 women and 29 men; mean age 22.0±3.7 years; mean body mass index [BMI] 24.2±3.5) participated. The experiment was advertised as a study of food cognition and personality.

Experimental Groups

Participants were assigned randomly to one of four conditions. Broccoli recall group (n=25): Participants were asked write about an occasion when they ate broccoli and include when they ate it, where, how it tasted, and how enjoyable it was. Journey recall group (n=23): Participants wrote about their journey to campus on the day of the experiment. This was to control for the effects of general recall on subsequent responses. Chips recall group (n=23): Participants wrote about a previous occasion in which they ate a food item dissimilar to broccoli (potato chips) to control for the effects of recalling an eating memory per se. Broccoli visualization group (n=24): Participants were instructed to read and visualise a nine-line narrative of a person enjoying eating