

Promoting Healthy Choices in Workplace Cafeterias: A Qualitative Study

Erica L. Thomas, PhD¹; Anna Puig Ribera, PhD²; Anna Senye-Mir, MSc²; Frank F. Eves, PhD¹

ABSTRACT

Objectives: To develop 3 point-of-choice campaigns to influence food choice in workplace cafeterias.

Design: Eight focus groups were conducted to guide campaign development.

Setting: Focus groups were conducted in the workplace.

Participants: University employees (n = 36) aged 23–58 years (mean, 33.8 years).

Phenomenon of Interest: To explore ways to prompt changes in behavior.

Analysis: Transcripts were analyzed using thematic analysis.

Results: This study identified calories and saturated fat as information that would have the greatest influence on food selection. Participants want this information at the time the choice is made. Participants reported limited time to eat at work, so converting nutrient density per 100 g or per serving to per portion consumed from point-of-choice labels was not a priority. Participants said that they have more time to read information in places where they line up for food, so at this point they are more open to persuasive messages. Effective messages urge the reader to take immediate action, which explains why they should chose the behavior and how it will help them achieve health.

Conclusions and Implications: Point-of-choice campaigns were well received, but factors such as cost, time, and availability of healthy food at work may shape choices to a greater extent than will nutrition information.

Key Words: point-of-choice, food choice, workplace health promotion, nutrition label (*J Nutr Educ Behav.* 2015; ■:1-8.)

Accepted November 1, 2015.

INTRODUCTION

Foods consumed away from home typically contain more calories and fat than those prepared in the home.¹ Frequent consumption of food away from home has been linked to higher rates of obesity.² One public health approach that has been proposed to address the role of food away from home in the obesity epidemic is nutrition labeling in restaurants and cafeterias.³ Nutrition labeling is most effective at the point of choice and should therefore be displayed on menu boards or next to

food items.⁴ Recently, work-based cafeterias have been targeted as an important venue in which to influence food choice.⁵ Most adults spend half their waking life at work⁶ and a substantial proportion of daily calories are consumed in this setting.⁷ Not only that, the workplace offers several advantages in that it provides access to a large audience and opportunities to influence employees' food choices on a daily basis. Attempts to reduce calorie and fat consumption throughout the year, a potential outcome from interventions in workplace cafeterias,

may be the key to long-term dietary improvements for employees.

Food choice is based on conscious reflection as well as automatic, habitual, and subconscious processes.⁸ Point-of-choice interventions work by targeting the latter, interrupting habitual food choice at the time the choice is made. They function by changing contextual cues in the environment to provoke deliberation about the behavior. Any such deliberation may result in the substitution for a health-enhancing alternative.⁹ Point-of-choice prompts are post-intentional or volitional aids to health behavior because they exert their effects after individuals have decided to improve their health; the prompt merely reminds individuals of their prior intention, ensuring that the opportunity for action is not missed. On its own, a prompt will not influence behavior; it must be preceded by an intention to change.⁹⁻¹¹ Thus, the formation of a behavioral intention is the starting point for behavior change with any prompting campaign.

The Theory of Planned Behavior (TPB)¹² provides 1 approach to modeling

¹School of Sport, Exercise, and Rehabilitation Sciences, University of Birmingham, Birmingham, United Kingdom

²Ciències de l'Activitat Física i l'Esport, Universitat de Vic, Catalonia, Spain

Conflict of Interest Disclosure: The authors' conflict of interest disclosures can be found online with this article on www.jneb.org.

Address for correspondence: Erica L. Thomas, PhD, School of Sport, Exercise, and Rehabilitation Sciences, University of Birmingham, Edgbaston, Birmingham B15 2TT, United Kingdom Phone: +44(0)1902 323745; E-mail: erica.thomas@hotmail.co.uk

©2015 Society for Nutrition Education and Behavior. Published by Elsevier, Inc. All rights reserved.

<http://dx.doi.org/10.1016/j.jneb.2015.11.001>

intentions. According to the model attitudes, salient beliefs about the costs and benefits of performing behavior have a strong influence on intentions. In turn, attitudes are a function of an individual's beliefs about the probability that behavior will produce a given outcome, weighted by the subjective value of that outcome, ie, how desirable or undesirable the outcome is. There have been several applications of the TPB to predict food choice. McEachan et al¹³ located 19 studies and found that the TPB accounted for 41% of variance in behavioral intentions, with attitude being the strongest predictor. It follows that a motivational approach emphasizing the costs and/or benefits of behavior might increase intentions to perform that behavior. A subsequent encounter with a prompt at the point of choice could then translate intentions into the planned behavior.¹⁴

When attempting to change behavior, both motivational strategies that aim to change attitudes and intention and the volitional strategies that aim to transform prior intentions into behavior are required. Effective prompting campaigns therefore require 2 main elements: information about the potential health benefits of the behavior and a sign that prompts behavior at the time the choice is made. Providing information about the benefits of behavior in the motivation phase is consistent with the idea of prompting individuals toward a healthier alternative in the volitional phase. Multiple component interventions are superior to a single prompt at the choice point for stair-climbing interventions^{10,11} and may also be superior for food choice.⁴ This research set out to develop both motivational and volitional strategies for use in a multicomponent point-of-choice intervention for food in workplace cafeterias. The optimal format for point-of-choice labels is currently unknown. However, survey studies identify calories as the information on menu labels that would have the greatest influence on item selection.^{15,16} In terms of how calories are displayed, Bleich and Pollack¹⁷ found an almost equal split in preference for calorie counts, physical activity equivalents, and percentage of recommended daily amount (RDA) in the US. Evidence on using symbols instead of numeric information to

indicate nutritional quality is currently unclear.¹⁸ Optimal message content and placement of campaign messages in cafeterias to increase motivation to use point-of-purchase labels is also unknown. Dominant dual process models of persuasion such as the Elaboration Likelihood Model¹⁹ argue that attitude change is most likely when health communication presents a strong argument. However, little research has been conducted on what constitutes a strong argument.

Qualitative research exploring employee food choice, nutrition knowledge, and information provision in the workplace is limited. For food choice, studies have shown that cost, convenience, limited availability of affordable healthy food, and time constraints and deadlines imposed on staff are the main barriers to healthy eating at work.²⁰ Regarding nutrition knowledge, this is often assessed quantitatively; the way in which people interpret and use this information is rarely captured. Qualitative studies often address this as background information and a possible determinant of label understanding and use. Much of this work is stakeholder-initiated; it is conducted by market research companies, contains no information on modes of data analysis, and has not gone through the quality control of refereed publications.²¹ Studies in academic research, however, are typically small and involve mostly women,²² but they have shown that people categorize the healthfulness of food in multiple ways. Individuals consider specific foods, components such as fat within food, the way food is produced, those foods for which intake should be restricted, and dietary goals.²³ They

also show that people have limited knowledge of dietary fats²⁴ and that although participants are familiar with the notion of calories, they do not always understand how to apply it.²⁵

As outlined earlier, this study aimed to develop campaigns and associated point-of-choice prompts to influence food choice in workplace cafeterias. Formative focus groups explored employees' interpretations of healthy eating, their knowledge of different labeling strategies, nutrition information, factors affecting food choice at work, and the best way to prompt changes in behavior. The researchers then analyzed this information to guide the development of campaign messages that targeted attitudes and intentions to encourage healthy choices in the work cafeteria. In addition, the preferred information and type of display for the prompts was explored. For these completely new elements, a second stage of focus groups explored comprehension of the materials and optimal placement within the cafeteria.

METHODS

Study Design and Participants

Eight focus groups were conducted in total. Six formative focus groups (n = 36) were conducted to guide campaign development. A further 2 evaluative/confirmative focus groups (n = 17) were conducted to explore motivational properties and comprehension of the campaign materials and optimal placement within the work cafeteria. The [Figure](#) shows the intervention messages. Two moderator guides ([Supplementary Figure 1](#)) were developed to explore the domains of

Heart health	<p>Eat less saturated fat and live up to six years longer. A diet high in saturated fat can raise the level of cholesterol in your blood and increase your risk of heart disease. To protect your heart look for the slice of pie. The smaller the slice, the less saturated fat.</p> <p>Ditch and switch to protect your heart. For a healthy heart chose poultry or fish over sausages and burgers and avoid pizzas, pastry and sausage rolls. For more ways to protect your heart, look for the slice of pie. The smaller the slice, the less saturated fat.</p>
Weight control	<p>Ditch and switch to lose weight. You could save around 140 calories everyday by giving up one sugary drink and replacing it with a sugar free drink or water. Over a year that's 51,000 calories. That's equivalent to a stone in weight. For more ways to save calories and lose weight, look for the slice of pie. The smaller the slice, the fewer calories.</p>

Figure. Intervention messages for the heart health and weight control campaigns.

interest. The moderator guides were semi-structured in that each group was asked the same key questions but was free to talk about issues that were of interest. The key questions were designed to meet the specific informational goals identified by the research team. The face validity of each guide was established by asking the opinions of 2 experts in the field. All study procedures and related documents received approval from the University of Birmingham ethical review board. Focus groups were conducted at the university. Participants were recruited by e-mails sent to all nonacademic staff in the College of Life and Environmental Sciences. To qualify, participants had to be a current nonacademic member of staff employed by the university and to have purchased food from the university cafeteria within the past 2 weeks. A questionnaire was used to establish eligibility. A total of 43 people responded to the invitational e-mail, 39 of whom met the inclusion criteria. A second questionnaire was e-mailed to eligible participants asking them to provide information about their sex, age, ethnicity, and self-reported height and weight so that researchers could calculate their body mass index (BMI). Three participants did not arrive for their focus group. Subsequently, 36 participants took part in the formative focus groups and 17 participants returned to pretest the intervention materials during the evaluative phase. Participants who arrived for their focus group received £20 (\$30.60).

Focus Group Discussions

Focus groups followed the procedures set out by Krueger.²⁶ The focus groups were facilitated by 2 researchers with 1 researcher acting as the moderator and the other observing, taking detailed notes, and summarizing for the participants at the end of the group to confirm the accuracy of the notes. Focus groups lasted for approximately 60 minutes, contained between 4 and 9 participants, and were homogeneous for sex and weight status (BMI, 18.5–24.9 = normal weight range; BMI \geq 25 = overweight²⁷); this allowed the researchers to identify commonalities and differences between groups. At the beginning of each session, participants were notified of the rules, format, and procedure

for the discussion. After reading a statement of objectives and assuring privacy, discussions were recorded.

Analysis

Focus group discussions were transcribed verbatim and coded thematically by 1 member of the research team (coder) using a constant comparative approach.²⁸ Transcripts were compared with detailed notes taken by the observer during the session to verify their accuracy. Inter-rater reliability was checked following the procedures carried out by Gough and Conner.²⁹ Three members of the research team were asked to allocate specific quotations to the core themes identified by the coder. Codes and themes were then revised until a high level of correspondence was reached, ie, \geq 95% of quotations were allocated to the correct core themes. This was calculated using the joint probability of agreement method, ie, number of times a team member agreed with the coder / total number of quotes \times 100.

Intervention Development

Results from the formative focus groups were used to guide the development of 3 campaign messages (Figure) and a prompt (Supplementary Figure 2). Although the main target of the intervention was weight control, reduced caloric intake can also be produced by targeting saturated fat in relation to heart health. A gram of saturated fat contains twice as many calories per gram as protein or carbohydrates.³⁰ Thus, reducing saturated fat consumption will have a proportionally greater impact on caloric intake compared with reduced intake of other nutrients. The campaign messages were constructed in accordance with the TPB to influence motivation by providing information about the possible benefits of behavior. According to Salovey,³¹ messages that emphasize benefits are gain-framed and should help to facilitate preventive behaviors. This component was designed to orient consumers to the presence of a subsequent point-of-choice label, alert those who wish to change that there is a healthier option, and give them a reason why they should choose the behavior and how

it will help them achieve the outcome related to health.

The first message was created to highlight the link between saturated fat and heart disease. The message urged consumers to eat less saturated fat to live 6 years longer (ie, benefit or gain). The information was based on a study by Tsevat et al,³² who modeled increases in life expectancy by reducing serum cholesterol. They projected an increase of 4.2 years for men and 6.3 years for women when serum cholesterol was reduced to 200 mg/dL. The second message was designed to highlight foods that are high and low in saturated fat and urged consumers to ditch and switch for the benefit of a healthy heart. The third message focused on soft drink consumption to raise awareness about the calories in sugary drinks and their impact on weight. This message urged consumers to switch to a sugar-free alternative to save 51,000 cal/y—a stone in weight. This was based on the idea that a typical soft drink contains around 140 cal. If consumed every day for a year, this would equate to 51,100 cal. The number of calories consumed over a year was then divided by the number of calories in 1 lb of fat, ie, 3,500 kcals. This equates to 14.6 lb or just over a stone in weight.

When designing the prompt, the main objective was to summarize the amount of calories or grams of saturated fat in different foods typically eaten in their entirety, eg, a whole banana, a main meal, using a non-numerical format. For this reason, pie charts were used because they provide a simple illustration of numerical proportion and may facilitate rapid judgments about the amount of calories or grams of saturated fat in food relative to the RDA.³³

RESULTS

Formative Focus Groups

Sixty-one percent of participants were female and 75% were of white British ethnicity. Mean age was 33.8 years (SD, 8.96 years). Thirty-three percent of participants were overweight according to their BMI. On average, participants purchased food from the work cafeteria twice a week. Self-reports revealed that women (mean, 2.64; SD, 1.43) purchased food more often than did men (mean, 1.79; SD, 1.37),

although not significantly so ($t[34] = 1.77; P > .05$), and normal weight individuals (mean, 2.42; SD, 1.42) purchased food somewhat more often than did overweight individuals (mean, 2.08; SD, 1.44), although again, this was not significant ($t[34] 0.65; P > .05$). The Table provides a demographic breakdown of participants by focus group.

Interpretations of healthy eating. Participants described healthy eating as (1) consuming 5 portions of fruits and vegetables a day, (2) incorporating protein from animal sources including fish, (3) limiting intake of fat, and (4) having a variety and balance of foods every day. Participants also categorized healthy eating in terms of specific foods, food components, foods requiring restriction, health risks, and dietary goals. Health risks associated with a poor diet, characterized by the consumption of foods high in saturated fat, salt (eg, pizza, burgers, and ready-made meals), and processed sugar (eg, candy, cookies, and chocolate), were mainly obesity and heart disease: “Too many fats and salts can lead to coronary heart disease and those sorts of related diseases” (normal weight female). Weight control and good health were participants' main dietary goals.

Factors affecting food choice at work. Participants said that cost, time, taste, ability to satisfy hunger, and the food environment influenced their food choices at work. Cost was the most important factor because many participants reported that healthy foods were more expensive: “You tend to find that the healthy option can be more expensive, which is a bit of a turn-off” (overweight male). Time to

eat and the food environment were also important because work schedules, long lines, and the availability of poor nutritional choices meant that participants found it difficult to eat a healthy lunch at work. Special dietary requirements, food allergies, intolerance, and restricted diets were influential factors for women in this study. Health was a consideration, but only for normal weight participants. For many participants, providing information about calorie content and reducing cost would facilitate healthy choices when food was available for purchase at work.

How people use and interpret nutrition information. Most participants said that they look for calorie totals and saturated fat content when making judgments about the healthiness of food. Normal weight participants said they also look for sugar content. Most people interviewed said they use the nutrition facts panel or front-of-pack labeling to find this information when purchasing food from the supermarket, but the media and advertising were also key sources of nutrition information for some. Participants reported that nutrition information was not always available when purchasing food in the work cafeteria, especially when food was served hot or without packaging. In this instance, participants rely on color, freshness, knowledge, experience, and guesses to determine whether food is healthy: “You have to rely on experience, but it's difficult. I do quite a bit of cooking and if you cook you tend to know what's healthy and what's not” (overweight male). When asked what nutritional information they would like to receive about food at work, participants listed all of

the nutrients currently provided on the front of most prepackaged foods, ie, calories, total fat, saturated fat, carbohydrates, and salt. Calories and saturated fat were deemed the most important in all focus groups. Fiber was the least important for women in this study.

Many participants said that nutrition information was hard to read or interpret. Women reported that food items typically consumed in their entirety should be labeled as such because calculating the calories or nutrients on food labels per 100 g or per serving was confusing. They said that they would not do the math required to translate the information into the actual number of calories or nutrients consumed: “Even when it tells you the weight of the actual product and the nutritional information is for 100 g, I'm not gonna do the maths” (normal weight female). Men said that they used the nutritional information per 100 g to compare products and determine their healthfulness.

Normal weight participants reported that reference intakes were not always available, which made it difficult to gauge how a particular food fit into an overall daily diet: “If that's [RDA] not there and you don't know it, then that is almost certainly confusing” (normal weight male). They were also concerned that reference intakes were based on average values and were not suitable for everyone because nutritional requirements vary with age, sex, weight, and activity levels, “Participant X [name made anonymous] and my RDAs are quite different” (normal weight male). The majority of men and overweight women interviewed said that they did not understand information about dietary fat, eg, good and bad fats, even though this was the nutrient about which they were most likely to express concerns:

Knowing what the saturated fats, polyunsaturated fats, and all the different types of fats are. You get bombarded with so many different types of things on news reports or academic reports about what's good for you and what you should eat and it all kind of blends in, it kind of goes in and you don't really understand. (overweight male)

Optimal format and location for nutrition information. Participants

Table. Demographic Characteristics of Participants in Each Focus Group

Focus Group	n	Sex	Mean Age (SD)	Mean Body Mass Index (SD)	Mean Cafeteria Purchases/Wk (SD)
1. Normal weight	8	Female	30.4 (8.8)	22.8 (1.5)	3.3 (1.3)
2. Overweight	7	Female	38.3 (10.6)	29.6 (5.1)	2.4 (1.5)
3. Normal weight	7	Female	34.1 (5.6)	21.0 (2.0)	2.1 (1.5)
4. Normal weight	4	Male	32.3 (3.3)	23.5 (1.5)	1.0 (0.0)
5. Normal weight	5	Male	37.0 (15.2)	22.0 (2.4)	2.6 (1.7)
6. Overweight	5	Male	30.8 (15.2)	27.7 (2.2)	1.6 (1.3)
7. Normal weight	8	Female	29.3 (6.0)	22.2 (1.5)	2.9 (1.3)
8. Overweight	9	Female	43.9 (11.8)	28.5 (4.8)	2.6 (1.8)

were asked to consider the optimal format and the most appropriate location for nutrition information at work. Each focus group favored the traffic light system because of its familiarity and ease of use:

It's what's simple and quick, isn't it, because you almost don't need to look at the words, you recognize what red would mean and what green would mean, so when you're in a rush you can quickly look, yeah, this is all right, and off you go. (normal weight female)

Participants also liked the wheel of health (which they described as a pie chart). Normal weight participants described how reference intakes were a useful way to summarize nutritional content as they related food to a total diet. Most participants said that they wanted nutrition information available to them at work, in the cafeteria, placed next to the target meal or product:

A sign by the food, because you can just have a look at the sign and go, yeah, I'll have that sandwich, or no, I won't. So if there is a sign directly by where you are purchasing your food from, it makes it easier. (normal weight female)

A preference for prompts positioned at the food was followed by information on menu boards and places where people line up, because this would give them time to read and think about the information before making their choice:

When you're actually queuing, perhaps that's when you can have the stations, perhaps periodically spaced where you can have the chart and you can say, Oooh, that would be a healthier option, where you've got time to think about it, then, before you get to the food and get to the till. (normal weight female)

Evaluative/Confirmative Focus Groups

Results from the formative focus groups were used to guide intervention development. Seventeen participants returned to pretest the intervention materials. All of the participants were female and 77% were white British.

The mean age was 36.56 years (SD, 11.79 years). A total of 53% were overweight. The Table shows a breakdown of participants by focus group. On average, participants purchased food from the work cafeteria 3 times a week. Normal weight individuals (mean, 2.88; SD, 1.25) purchased food somewhat more often than overweight people (M, 2.63; 1.77), although not significantly so ($t[14] = 0.33; P > .05$).

Motivational component: message content. The messages were well received in both groups, although some participants felt that the length of the ditch and switch campaigns would not attract them to read the information in the first place. Despite this, most said that they would read the information if they were lining up for food. Concerning the heart health and saturated fat campaigns, both focus groups liked the caption "Eat less saturated fat and live up to 6 years longer" because it presented a strong argument and a bold scientific claim: "I like the first sentence; I think it's got quite an impact" (overweight female). They also liked the supporting information describing how saturated fat affects heart health because it added credibility to the message: "I think the statistics and the facts are good; it reinforces the messages and gives people a reason to do them" (normal weight female). Some participants suggested that the message was more likely to resonate with older workers than young people: "I think if you're young, you might not even care because 6 years might not be nothing then; the older you are, it might mean a lot" (normal weight female).

Participants really liked the slogan "Ditch and switch" because the word-play was "catchy" and "memorable" and urged them to take immediate action: "It's more a call to action, really, isn't it?" (normal weight female). Participants liked the idea of food swaps but criticized the campaign because the healthy substitutions did not motivate them to eat healthy: "I'm drooling over what's listed on the bad side, but when you look at what's on the right, I think is that all I've got to eat, that's pretty boring and it doesn't encourage me to want to eat healthy" (normal weight female).

When discussing the heart health campaigns and their ability to motivate behavior change, there was a mixed response. For some, the campaigns would motivate behavior change if they read the information while waiting on line because the information gave them a reason why they should choose the behavior. Others said that factors such as cost and the food environment would override the benefits even if the message motivated them to change their behavior:

I would think about changing my option, but then it's always more expensive to get the healthy option. If I've only got £2 in my purse and I can't afford the healthy option, then I'm going to carry on with what I've got. (normal weight female)

There was mixed opinion about the weight loss campaign. Some overweight participants were put off by the suggestion of switching to a sugar-free alternative: "I don't like it because it might be less calories, but it's not necessarily good for you with the sweeteners" (overweight female). Other participants were clearly motivated by losing weight: "I think the message is good. A stone in weight for the year is good; 50,000 cal is a hell of a lot for a year" (normal weight female). Many participants said that they forget to count liquid calories. For normal weight participants, providing information about liquid calories was a new and interesting message: "I think it's really good; people don't realize how many calories there are in everything they drink" (normal weight female). Participants in both focus groups said that information about the calories in food would be better in a cafeteria environment and that information about liquid calories would be more appropriate and influential next to office vending machines. Everyone liked the slogan "Ditch and switch" for the reasons outlined earlier.

Volitional component: comprehension, usability, and acceptability of the prompts. Normal weight participants were comfortable with the meaning of the pie chart and understood how to use it to guide their choice: "When I was weighing up 2 meals, if I wanted both equally, I'd pick the one

with the smaller slice" (normal weight female). Most felt that the pie charts were quick and easy to use: "I like that; it's really quick, so when you're under pressure you've got your pie icon, yeah, it's quick, I like that" (normal weight female). However, pie charts were not seen as easy as the traffic light system. For the second focus group, the prompts were redesigned to incorporate the traffic light system. Green was the healthiest choice and red the least healthy. Surprisingly, with this format, participants had difficulty understanding the prompt and described it as overly complicated and confusing: "I think, keep it to one color and then start to increase the pie" (overweight female). Participants in both focus groups were concerned that the prompts failed to consider other key nutrients, which meant that they were unable to make an informed decision about the overall healthiness of the product:

It doesn't take into account other stuff, so it might be low in saturated fat but really high in sugar, and I think it's quite dangerous to judge all your food on how much saturated fat is in it. (overweight female)

DISCUSSION

Participants in this study wanted nutrition information available to them when purchasing food at work, especially information about calories and saturated fat because this would facilitate healthy choices. They also wanted an estimate of how many calories they needed, ie, a reference intake based on their sex, age, and activity level. For many participants, current nutrition information was hard to read and interpret. Women did not want to do the math to convert nutrient levels from per 100 g or per serving to per portion consumed. There was confusion about the differences between saturated and unsaturated fat. This is consistent with earlier findings.^{24,34} In the absence of nutrition information, participants relied on guesswork to determine whether food was healthy. This is problematic because consumers often underestimate calories and fat in foods eaten away from home.³⁵ Participants in this study had limited time to eat at work, so they wanted simple color-coded information that allowed

them to judge at a glance whether a product had too many calories or too much saturated fat. They wanted this information next to the target meal or product, on menu boards and places where they lined up for food. This suggests that effective prompting campaigns require 2 elements: information before the choice is encountered and a simple uncomplicated sign that prompts behavior at the time the choice is made.

Consistent with the findings of Bisogni et al,²³ participants in this study categorized healthy eating in terms of specific foods, food components, and those requiring restriction. It is encouraging that participants' understanding of healthy eating conformed to United Kingdom government dietary guidelines³³ and that they were knowledgeable about issues regarding food and health. Despite this, health did not take precedence when participants purchased food at work. Similar to the results of Pridgeon and Whitehead,²⁰ external factors such as cost, time to eat, and the availability of healthy food exert a greater impact on food selection at work, as they do in general.³⁶ Many factors that determine food choice at work are outside the control of individual employees. This highlights the need for organizations to create a supportive healthy eating environment: for example, by reducing the cost of healthy food, providing workers with adequate time to eat their meal, and offering healthier food options in the staff cafeteria. Indeed, some studies have shown that price modifications can be more effective than health promotion messages to motivate people to purchase healthier items.³⁷ Even when a supportive healthy eating environment at work is available, consumers may value variables such as taste and ability to satisfy hunger more highly than they do health, which makes these variables barriers to using nutritional information in most food choices. Nonetheless, participants in this study wanted nutrition information available to them when purchasing food at work, even if it did not always influence their selection. This echoes previous research in which 76% of US adults indicated that such information would be at least somewhat useful in making healthier choices.¹⁷

Concerning the volitional aspects of the intervention, participants in

this study wanted a simple uncomplicated label placed next to the target meal or on menu boards to signpost healthy choices. In other words, they wanted a cue at the time the choice was made, to ensure that the opportunity for action was not missed. Concerning the motivational aspects, it stands to reason that people have more time to read and think about information in places where they line up for food, so they are much more open to persuasive messages. This supports the idea that there are 2 distinct phases in initiating action that require a multicomponent approach: a motivational phase during which people consciously consider information, weighing the costs and benefits of behavior; and a volitional phase that culminates in actual performance.

In terms of the format for the volitional component, the level and extent of information that is required at the point of choice are driven by individual dietary goals and thus the need to focus on particular information. Many participants identified calories as the information that would have the greatest influence on item selection, which is consistent with a previous report.²¹ Saturated fat ranked second. Regardless of this, providing information on 1 key nutrient in the second round of focus groups did not provide the breadth of information participants wanted to make a confident decision about the overall healthiness of a product. Instead, participants wanted information about calories, total fat, saturated fat, sugar, and salt in 1 simple, easy-to-use format. This supports the work of Hwang and Lorenzen,³⁸ who found that multiple types of nutrition information were more effective and credible than only 1 type. Nonetheless, attempts to satisfy all information needs in a particular label are likely to result in label overload.³⁹ The aim of point-of-choice prompts is to act as a quick reminder, indicating healthier alternatives. It seems unlikely that a single prompt could provide all of the information participants require and still be expected to work. Compromises may have to be made between informational content and a simply formatted label.

Calculating the values on labels, ie, converting nutrient levels from per

100 g or per serving to per portion typically consumed at the point of choice, was neither interesting nor a priority for many participants. Therefore, point-of-choice labels should rely on tasks that consumers find easy in time-pressured situations, such as product comparison (per portion typically consumed, not per 100 g) and high–low judgments.³¹ Participants said that the pie charts were quick and easy to use. They understood that the slice of pie represented the number of calories or grams of saturated fat in foods typically consumed in their entirety. They also understood how to use the pie charts to compare products. It is unclear whether participants understood how to use the pie charts to judge the amount of calories or grams of saturated fat in food relative to recommended nutrient intakes. It was also unclear whether the pie chart should represent needs per meal or as a proportion of daily needs. When these reference intakes were compared using calorie counts, 61% of participants preferred the needs per meal format.⁴⁰

Regarding the motivational component, reports suggest that participants prefer messages that are concise and unequivocal and urge the reader to take immediate action. The message must also give readers a reason why they should choose the behavior, promote the benefits, and explain how the behavior will help them achieve the outcome related to health. For decades, public health organizations have warned consumers about dietary fat and its effect on weight, cholesterol, and heart disease. Evidently participants were aware of those health risks but felt that information was contradictory, which left them confused about which fats to eat and which to avoid. This confusion stems from conflicting advice about nutrition from experts and the media (see quote at the bottom of p. 4). Indeed, the media and advertising were important sources of nutrition information for participants.

Shortcomings of the current study included limited generalizability of the qualitative data and an inability to predict how the intervention might affect real choice behavior. It is also possible that the bias in the sample, ie, a higher proportion of women and white British than men and other ethnic groups, could threaten general-

izability. The overrepresentation of women may reflect the fact that women report a greater interest in menu labeling than do men.⁴¹ Self-selection may also mean that those who volunteered for the focus groups were more interested in nutrition and menu labeling. Focus group dynamics might have influenced the information that participants decided to share or not. Finally, the researchers are unable to predict whether the intervention would have had a positive influence on overweight and obesity. Despite these limitations, focus groups are a valuable tool for gathering detailed information about how people feel and think about menu labeling strategies.⁴²

IMPLICATIONS FOR RESEARCH AND PRACTICE

Work-based nutrition interventions have the potential for broad reach. However, barriers such as cost, time to eat, and the availability of healthy food at work may shape choices to a greater extent than can nutrition information. This study identified calories and saturated fat as information on menu labels that would have the greatest influence on food selection at this worksite. Participants want this information at the time the choice is made, to ensure that the opportunity for action is not missed. Conversely, they have more time to read and think about information in places where they line up for food, so at this point they are much more open to persuasive messages. This supports the idea that the 2 distinct phases in action initiation may be better served by a multicomponent approach. The qualitative data support the use of pie charts to indicate nutritional quality. However, further work is required to explore how consumers use the pie charts, ie, for product comparison, part–whole judgments, or both, and how effective they may be to facilitate healthy choices. It is also clear from the current findings that the more that health professionals can agree on a set of clear and consistent messages based on current scientific knowledge, the sooner recommendations for a healthful diet will be accepted and followed.

ACKNOWLEDGMENTS

This research was funded by a Bupa Multi-Country grant.

SUPPLEMENTARY DATA

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.jneb.2015.11.001>.

REFERENCES

1. Variyam JN. Nutrition labeling in the food-away-from-home sector: an economic assessment. US Department of Agriculture. <http://www.ers.usda.gov/publications/err4/err4.pdf>. Accessed December 9, 2015.
2. Pereira MA, Kartashov AI, Ebbeling CB, et al. Fast-food habits, weight gain, and insulin resistance (the CARDIA study): 15-year prospective analysis. *Lancet*. 2005;365:36–42.
3. Downs JS, Loewenstein G, Wisdom J. Strategies for promoting healthier food choices. *Am Econ Rev: Papers & Proceedings*. 2009;99:159–164.
4. Harnack LJ, French SA. Effect of point-of-purchase calorie labeling on restaurant and cafeteria food choices: a review of the literature. *Int J Behav Nutr Phys Act*. 2008;5:51.
5. NICE. *Obesity: Guidance on the Prevention, Identification, Assessment and Management of Overweight and Obesity in Adults and Children. Clinical Guideline 43*. London, UK: NICE; 2006.
6. Dishman RK, Oldenburg B, O'Neal H, Shephard RJ. Worksite physical activity interventions. *Am J Prev Med*. 1998;15:344–361.
7. Katz DL, O'Connell M, Yeh M, et al. Public health strategies for preventing and controlling overweight and obesity in school and worksite settings: a report on recommendations of the Task Force on Community Preventive Services. <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5410a1.htm>. Accessed December 9, 2015.
8. Furst T, Connors M, Bisogni CA, Sobal J, Winter-Falk L. Food choice: a conceptual model of the process. *Appetite*. 1996;26:247–266.
9. Olander E, Eves FF. Elevator availability and its impact on stair use in a workplace. *J Environ Psychol*. 2011;31:200–206.
10. Eves FF, Webb OJ, Griffin C, Chambers JA. Multi-component intervention targeting caloric expenditure

- with stair climbing: effects on behavior, attitudes and intentions. *BMC Public Health*. 2012;12:423.
11. Lewis A, Eves FF. Testing the theory underlying the success of point-of-choice prompts: a multi-component stair climbing intervention. *Psychol Sport Exerc*. 2012;13:126-132.
 12. Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis Process*. 1991;50:179-211.
 13. McEachan R, Conner M, Lawton R. A meta-analysis of theory of planned behavior studies: the impact of behavior type. In: Conner M, Norman P, eds. *Predicting Health Behavior*. 2nd ed. Glasgow, UK: Open University Press; 2005:170-222.
 14. Lewis AL, Eves FF. Testing the theory underlying point of choice prompts: a multi-component stair climbing intervention. *Psychol Sport Exerc*. 2012;13:126-132.
 15. Lowe DM. *The Effect of Menu Nutrition Labels on Consumers' Dietary Decision Making*. Amherst, MA: Hospitality and Tourism Management, University of Massachusetts Amherst; 2012.
 16. Yoon H, George T. Nutritional information disclosure on the menu: focusing on the roles of menu context, nutritional knowledge and motivation. *Int J Hosp Manage*. 2012;31:1187-1194.
 17. Bleich SN, Pollack KM. The public's understanding of daily caloric recommendations and their perceptions of calorie posting in chain restaurants. *BMC Public Health*. 2010;10:121.
 18. Krieger J, Saelens BE. Impact of menu labeling on consumer behavior: a 2008-2012 update. <http://healthyeatingresearch.org/wp-content/uploads/2013/12/HER-RR-Menu-Labeling-FINAL-6-2013.pdf>. Accessed December 9, 2015.
 19. Petty RE, Cacioppo JT. The elaboration likelihood model of persuasion. In: Berkowitz L, ed. *Advances in Experimental Social Psychology*. London, UK: Academic Press, Inc; 1986:123-205.
 20. Pridgeon A, Whitehead K. A qualitative study to investigate the drivers and barriers to healthy eating in two public sector workplaces. *J Hum Nutr Diet*. 2013;26:85-95.
 21. Grunet KG, Wills JM. A review of European research on consumer response to nutrition information on food labels. *J Public Health*. 2007;15:385-399.
 22. Povey R, Conner M, Sparks P, James R, Shepherd R. Interpretations of healthy eating and implications for dietary change. *Health Educ Res*. 1998;3:171-183.
 23. Bisogni CA, Jastran M, Seligson M, Thompson A. How people interpret healthy eating: contributions of qualitative research. *J Nutr Educ Behav*. 2012;44:282-301.
 24. Gans KM, Lovell HJ, Fortunet R, McMahon C, Carton-Lopez S, Lasater TM. Implications of qualitative research for nutrition education geared to selected Hispanic audiences. *J Nutr Educ*. 1999;31:331-338.
 25. van Kleef E, van Trijp H, Paeps F, et al. Consumer preferences for front-of-pack calorie labeling. *Public Health Nutr*. 2007;11:203-213.
 26. Krueger R. Designing and conducting focus group interviews. <http://www.eiu.edu/~ihcc/Krueger-FocusGroupInterviews.pdf>. Accessed July 8, 2015.
 27. National Heart, Lung, and Blood Institute. The practical guide to the identification, evaluation and treatment of overweight and obesity in adults. October 2000. http://www.nhlbi.nih.gov/files/docs/guidelines/prctgd_c.pdf. Accessed December 9, 2015.
 28. Glaser BG. The constant comparative method of qualitative analysis. *Soc Probl*. 1965;12:436-445.
 29. Gough B, Conner M. Barriers to healthy eating amongst men: a qualitative analysis. *Soc Sci Med*. 2005;63:387-395.
 30. Westerterp KR, Verboeket-van de Venne WP, Westerterp-Plantenga MS, Velthuis-te Wierik EJ, de Graaf C, Weststrate JA. Dietary fat and body fat: an intervention study. *Int J Obes Relat Metab Disord*. 1996;20:1022-1026.
 31. Salovey P. Promoting prevention and detection: psychologically tailoring and framing messages about health. In: Bibace R, Laird JD, Noller KL, Valsiner J, eds. *Science and Medicine in Dialogue: Thinking Through Particulars and Universals*. Westport, CT: Praeger Publishers/Greenwood Publishing Group, Inc; 2005:17-42.
 32. Tsevat J, Weinstein MC, Williams LW, Tosteson AN, Goldman L. Expected gains in life expectancy from various coronary heart disease risk factor modifications. *Circulation*. 1991;83:1194-1201.
 33. Public Health England. Your guide to the eatwell plate: helping you eat a healthier diet. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/340869/2014-250_-_eatwell_plate_Final_version_2014.pdf. Accessed December 9, 2015.
 34. Levy AS, Fein SB. Consumers' ability to perform tasks using nutrition labels. *J Nutr Educ Behav*. 1998;30:210-217.
 35. Block JP, Condon SK, Kleinman K, et al. Consumers' estimation of calorie content at fast food restaurants: cross sectional observational study. *BMJ*. 2013;346:f2907. <http://dx.doi.org/10.1136/bmj.f2907>.
 36. Glanz K, Basil M, Maibach E, Goldberg J, Snyder D. Why Americans eat what they do: taste, nutrition, cost, convenience, and weight control concerns as influences on food consumption. *J Am Diet Assoc*. 1998;98:1118-1126.
 37. French SA, Jeffery RW, Story M, et al. Pricing and promotion effects on low-fat vending snack purchases: the CHIPS Study. *Am J Public Health*. 2001;91:112-117.
 38. Hwang J, Lorenzen CL. Effective nutrition labeling of restaurant menu and pricing of healthy menu. *J Food service*. 2008;19:270-276.
 39. Usmanova N, Thor E. Communicating nutritional information to the global consumer: adapting to shifting consumer attitudes toward nutrition. *International Food and Agribusiness Management Review*. 2003;6(2).
 40. Fitch RC, Harnack LJ, Neumark-Sztainer DR, et al. Providing calorie information on fast-food restaurant menu boards: consumer views. *Am J Health Promot*. 2009;24:119-132.
 41. Piron J, Smith LV, Simon P, Cummings PL, Kuo T. Knowledge, attitudes and potential response to menu labeling in an urban public health clinic population. *Public Health Nutr*. 2010;13:550-555.
 42. Swartz J, Dowray S, Braxton D, et al. Simplifying healthful choices: a qualitative study of a physical activity based nutrition label format. *Nutr J*. 2013;12:72. <http://dx.doi.org/10.1186/1475-2891-12-72>.

CONFLICT OF INTEREST

The authors have not stated any conflicts of interest.

REVISED PROOF