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Beliefs Underlying the Decision to Eat Breakfast: The Role of Theory-based Behavioral Analysis in the Development of Policy, Communication and Educational Interventions for Healthy Eating

Susan E. Middlestadt,
Indiana University, USA

Laurel D. Stevenson,
Indiana University, USA

Chia-Ling Hung,
Indiana University, USA

Maria Leia Roditis,
University of California, San Francisco, USA

Alyce D. Fly, and
Indiana University, USA

Jylana L. Sheats
Stanford University School of Medicine, USA

Abstract

Policy, communication, and education efforts to influence any social or health outcome are more effective if based on an understanding of the underlying behaviors and their determinants. This conceptual paper outlines how behavioral theory can help design interventions for one healthy eating behavior, eating breakfast. More specifically, the paper illustrates how a prominent health behavior theory, the Reasoned Action Approach, can be used to guide formative research to identify factors underlying people's decisions. Select findings are presented from three studies of beliefs underlying eating breakfast: online surveys with 1185 undergraduates from a large university in Indiana; in-depth interviews with 61 adults from four Indiana worksites; and 63 in-depth interviews with students from three middle schools in rural Indiana. Analyses of data from the undergraduates demonstrated the role of self-efficacy. Analyses of data from the working adults revealed the importance of normative beliefs about what employers believed. Analyses comparing consequences perceived by adults with those perceived by middle school students found that both groups believed that eating breakfast would provide energy but only middle school students believed that eating breakfast would improve alertness. For each finding, the theory is presented, the finding is described, implications for interventions are suggested, and the need for additional research is outlined. In sum, theory-based behavioral research can help develop interventions at intrapersonal, interpersonal, and environmental levels that are warranted to encourage healthy eating.

Keywords

Behavioral Analysis; Reasoned Action Approach; Health Behavior Theory; Breakfast Consumption; Public Health Interventions

Health professionals continue to search for ways to establish eating behaviors that promote good health (Glanz, 1999; Irvin, Ary, Grove & Gilfillian–Morton, 2004). As with any health behavior change, it is likely that efforts to encourage healthy eating need to consider components at multiple levels and to use a full range of intervention types, including structural, policy, communication, and education interventions (Bartholomew, Parcel, Kok, Gottlieb & Fernandez, 2011; Green & Kreuter, 2005). With regard to food choices, four levels of influence have been identified (Story, Newmark–Sztainer & French, 2002): intrapersonal influences (e.g., psychosocial, biological); interpersonal factors (e.g., family and peers); built environment (e.g., schools, fast food outlets, convenience stores); and macrosystem or societal factors (e.g., policies, mass media, social and cultural norms). How then should we decide the level, type, and content of interventions? The approach recommended here is to base interventions on a theory–based behavioral analysis (Glanz, 1999; Irvine et al., 2004). The purpose of this article is to illustrate how a behavioral analysis based on a prominent theory of behavior, the Reasoned Action Approach (Fishbein and Ajzen, 2010), can guide formative research which will help us understand how people make decisions about behaviors, will guide interventions to encourage the practice of healthy behaviors and will suggest additional research.

Theory–based behavioral analysis will be demonstrated with three studies of beliefs about eating breakfast. The behavior of eating breakfast has been defined by Albertson et al., (2007) as any food intake between 5:00AM and 10:00AM on weekdays or 5:00AM and 11:00AM on weekends. Regular consumption of breakfast has been associated with a number of health benefits affecting individuals across the life span, including lower rates of overweight and obesity, better food and nutrient profiles, increased opportunity to meet Dietary Guidelines for Americans, higher levels of physical activity, improved cognitive function and performance as well as psychosocial functioning (Affenito et al., 2005; Albertson et al., 2007; Deshmukh–Taskar, Nicklas, O’Neil, Keast, Radcliff & Cho, 2010; Harding, Teyhan, Maynard, & Cruickshank, 2008; Kerrer, Yang, Obayashi, Branchi & Song, 2006; Kleinman et al., 2002; Matthys, DeHenauw, Bellemans, DeMaeyer & DeBacker, 2007; Murphy et al., 1998; Pollitt & Matthews, 1998; Rampersaud, 2008). Yet, Niemeier, Raynor, Lloyd–Richardson, Rogers and Wing (2006) reported in their five–year longitudinal study of adolescents and adults that breakfast skipping markedly increased during the transition from adolescence to adulthood. The data described here examine beliefs about eating breakfast among three populations from the state of Indiana: undergraduates from a large university; employees from two rural and two urban worksites; and students from three rural middle schools.

The Reasoned Action Approach (RAA) is the latest formulation of the Theory of Reasoned Action, the Theory of Planned Behavior, and the Integrative Model (Fishbein & Ajzen, 2010). This theory outlines factors that are presumed determinants of behavior and that are common to several of the major theories of health behavior (Fishbein, Triandis, Kanfer, Becker, Middlestadt & Eichler, 2001). It has been used successfully to understand the factors underlying behavioral decision–making in a variety of domains (e.g., Albarracin, Johnson, Fishbein & Muellerleile, 2001; Godin & Kok, 1996). According to the RAA, the immediate determinants of a behavior are a person’s intention to engage in the behavior and their actual control as influenced by environmental factors and the individual’s skills and abilities. Intention is, in turn, influenced by a combination of three global components: attitude towards the act, defined as the positive or negative evaluation of the behavior; normative pressure based on the perception of what important others believe and do; and self–efficacy or perceived behavioral control about how much the behavior is seen as being under the control of the individual as opposed to the environment. These global components are themselves determined by sets of salient beliefs: behavioral beliefs about the salient consequences of the behavior for the attitude component; normative beliefs about what

salient others believe for the normative component; and control beliefs about salient circumstances for the self-efficacy or perceived control component. Not all beliefs are considered to be potential causes. Only those that are at the top-of-the mind of the relevant segment of the population operate as causes according to the RAA. Thus, an important step in applying the RAA to intervention design is a salient belief elicitation to identify the subset of beliefs more frequently accessed when the segment of the population is asked to think about performing the behavior (Middlestadt, Bhattacharyya, Rosenbaum, Fishbein & Shepherd, 1996).

Method

Data used to illustrate the points in this conceptual paper come from larger studies. Details of the first study of undergraduates are presented elsewhere (Gassman, Agley, Johnston, Middlestadt, Youssefagha & Van Puymbroeck, 2012). Briefly, an online survey covering a number of health topics was conducted with 1185 undergraduates from one school of a large university in Indiana. In the section on nutrition, they were told that “Breakfast is the first meal of the day, usually in the morning” and asked “how many of the past 7 days did you eat breakfast?” Then they completed fixed-alternative items to assess the RAA constructs with respect to eating breakfast every day for the next month: two for intention, two for attitude toward the act, three for perceived norm, and two for self-efficacy. Scales were created by averaging the available responses for each of the four constructs and a regression analysis predicted intention from the three global components.

Details on the face-to-face interview studies of adult workers and of 7th and 8th grade students are presented in Middlestadt (2012). Briefly, quantitative data on behaviors and demographic characteristics were gathered from 243 adults from two rural and two urban worksites in Indiana and from 344 students from three middle schools in rural Indiana. Qualitative data eliciting beliefs about eating breakfast every weekday for the next three months were collected from a subsample of 63 middle school students and 61 adult workers. More specifically, participants were told “as you may know, health educators tell us to eat breakfast every day. We want to know what you think and feel about eating breakfast every week day for the next three months. There are no right or wrong answers. Just say what comes to your mind first.” Then they were asked six open-ended questions: two to elicit salient consequences (i.e., what are the advantages or good things that might happen if you eat breakfast every week day for the next three months? what are the disadvantages or bad things that might happen...?); two to elicit salient referents (i.e., who, which people or groups, might approve or support you when you eat breakfast every weekday for the next three months? Who, which people or groups, might disapprove ...?); and two to elicit salient circumstances (i.e., what might make it easier for you to eat breakfast every weekday for the next three months? What might make it harder to...?). Categories were created based on a content analysis of verbatim responses. Frequency analyses revealed the percent who mentioned each category of salient beliefs.

Results and Implications

In the sample of undergraduates, participants were primarily white (88.0%) and female (68.1%). The mean age was 20.5 years old. About one-third (35.0%) of the undergraduates indicated they ate breakfast on all seven of the seven days before the survey. In the sample of middle school students, participants were primarily white (94.8%) and about half were female (53.2%). They were split between 7th grade (54.7%) and 8th grade (45.3%). They ranged in age from 12 to 15 years old (mean=13.1 years). About half (49.1%) of the middle school students ate breakfast on all five of the five weekdays before the interview. Most of 47 the adult participants were white (84.7%) and female (77.0%). Adults ranged in age from

23 to 67 years (mean=44.0). Most (65.6%) of the adult workers reported eating breakfast on all five of the five weekdays before the interview.

Identifying the Relative Importance of the Three Global Components

A key step in an RAA analysis is to determine the relative weights of the three global components in predicting intention and thus to identify which component(s) to address with an intervention. If the weight for the attitude component is high, the behavior is under the control of the attitudinal component and one could improve the behavior with an intervention that emphasizes particular advantages or disadvantages. If the weight for the normative component is high, the behavior is under the control of perceived norm and an intervention that addresses what significant others perceive is warranted. If the weight for the self-efficacy or perceived control component is high, one needs to change the self-efficacy component by influencing the circumstances that make the behavior easier or more difficult to perform.

The data from the undergraduates can illustrate how the key component is identified. The multiple R predicting intention from the three global factors was .855 ($F=918.439$, $df=3$, 1016 , $p<.0001$). The relative weights were .087 for attitude toward the act of eating breakfast every day, .152 for perceived norm, and .721 for self-efficacy or perceived behavioral control (Middlestadt et al., 2010). With a sample size of 1185, all three of the weights were statistically significant. However, it is clear from the size of the weights that eating breakfast is primarily under the control of the self-efficacy or perceived behavioral control global component. This implies that, at least for undergraduates from this large university in Indiana, interventions to encourage undergraduates to eat breakfast might address perceived control or self-efficacy.

The self-efficacy or perceived control component of the RAA assesses how individuals perceive their behavior and their environment. Do they believe the behavior is under their own control or is it outside of their control and under the control of the environment? This component can be addressed with two types of interventions. One approach would be an educational or skill-building intervention that helps the individual bring the environment under control by teaching them either how to shape their environment or how to navigate the environment they experience. For example, undergraduates might be taught where on campus to find breakfast or how to rapidly prepare a healthy one using food that is easy to keep on hand. An alternative approach would be a structural or policy intervention that actually changes the environment experienced by the individuals. Universities can allow food vendors to locate in dormitories or classroom buildings and to provide healthy items that students can take with them to class.

Additional theory-based research would help determine which of these approaches is better and would provide content for the intervention. More specifically, a qualitative salient belief elicitation (as was conducted with the adult workers and the middle school students) would identify which circumstances are underlying the self-efficacy component. A quantitative study with a larger sample and close-ended items based on the qualitative results would determine which of the hindering or facilitating circumstances identified in the qualitative research are more strongly associated with intention. And an observation study would help determine what the environment actually looks like near and on campus.

Identifying a Differentiating Salient belief Underlying Perceived Norm

Once one has selected the component to address, one needs to identify the specific salient beliefs which need to be influenced in order to change this component. Data from the salient belief elicitation underlying the normative component can illustrate this role of theory.

Adults workers from four worksites in Indiana were asked who (which people or groups) would approve or support them if they eat breakfast every week day as well as who would disapprove. Employers were the only social group elicited when these workers were asked who disapproved of eating breakfast. More specifically, 21.3% of the adult workers mentioned that employers might disapprove. To assess the importance of employer beliefs, the adults in the sample were divided into “doers” (40 ate breakfast on all five of the weekdays preceding the interview) and “non-doers” (21 who ate breakfast four or fewer days). A comparative analyses revealed that the percent mentioning employers as disapproving was statistically significantly higher ($p < .05$ with Fisher’s exact test) among “non-doers” (23.8%) than among “doers” (5.0%). More “non-doers” than “doers” see their employers as disapproving. Stated another way, the normative belief about what employers think a worker should do functions as a differentiating belief.

These data imply that the employer plays a vital role in influencing workers’ intentions to eat breakfast and suggest that any intervention to encourage eating breakfast must involve the employer. It may be that communications about the recommendation to eat breakfast would be more effective if they actually come from the worker’s employer. It may be that immediate, frontline supervisors need to be very clear when they talk with the people that work under them that they approve of breakfast. It may be that employers are critical in establishing a healthy work environment with supportive policies and structures.

Once again, behavioral theory recommends additional research to guide these intervention decisions. Larger scale quantitative research with the adult workers using close-ended items based on the qualitative analyses would verify and quantify the importance of normative beliefs about what employers think in predicting intention and behavior. Follow-up interviews with workers would help determine what employers do which lead workers to conclude they approve or disapprove. In addition, research with the employers would be useful. What do employers actually believe? Do employers understand the benefit of eating breakfast on productivity at work? Behavioral research on the beliefs that employers hold about the behavior of recommending their employees eat breakfast every week day would help identify the factors that influence employer decision-making.

Identifying which Salient Consequence to Emphasize

Educational and communication interventions that influence beliefs by pointing out the benefits of a behavior are important tools in the behavior change toolkit. With limited resources, it is cost-effective to prioritize beliefs. Furthermore, it is useful to determine if the same communication or education activity can be used for several audiences or if it is necessary to tailor the content and develop different communications for different segments of the population (Kreuter & Skinner, 2000). Theory-based analyses about beliefs can help identify which perceived benefits to emphasize and can help us determine when we need to design different interventions for different segments.

Comparative analyses of the beliefs about consequences of eating breakfast can illustrate how to select which belief to emphasize. Adult workers and middle school students were asked about the good things that might happen if they eat breakfast every weekday for the next three months. “Will give me energy” was one of the most frequently mentioned consequences for both of these segments of the population: 41.1% of the adults and 47.6% of the middle school children mentioned that eating breakfast every weekday would give them energy ($p=0.476$). While adults and middle school students were similar on their beliefs about the role of breakfast in providing energy, these two groups differed on the belief that eating breakfast “will wake me up or make me less tired.” Statistically significantly more students (46.6%) than adults (14.8%, $p < .01$) mentioned the effect of eating breakfast on alertness.

These findings suggest that a communication or education intervention targeting both adults and students could emphasize the perceived benefit of breakfast on energy. However, if one were tailoring interventions to middle school students, the intervention might do well to address the effect of breakfast on alertness. Behavioral theory suggests additional research to confirm and further develop these recommendations for intervention design. At a minimum, larger scale studies using close-ended items based on the results of the qualitative elicitation studies need to be conducted to provide quantitative data for more advanced analyses to confirm and clarify the results.

Conclusion

In order to encourage healthy eating habits, interventions of different types and at different levels are recommended. This conceptual paper illustrates how a theory-based behavioral analysis can help design interventions by identifying which beliefs to address when. Using the Reasoned Action Approach and studies of eating breakfast among college students, among adult workers, and among middle school students, we demonstrated how theory can be used to conduct formative research to design interventions. Analyses of data from undergraduate students demonstrated the role of self-efficacy in eating breakfast. Analyses of data from adults from four worksites revealed the importance of normative beliefs about what employers believed. And, analyses comparing consequences perceived by adults to those perceived by middle school students demonstrated similarities and differences in the belief structures of two groups. In each case, theory-based suggestions were made about interventions to try as well as about next research steps to consider. In general, it is clear that the factors influencing breakfast consumption include determinants at intrapersonal, interpersonal, and environmental levels and that interventions are needed at these different levels. Educational interventions might address beliefs held by individuals. Communication interventions might consider interpersonal relationships and communication with key influencers like employers. Interventions might focus on helping individuals deal with their present environment by building their skills at navigating or changing their environment. Interventions might be structural in nature, aiming to change the policy, physical or social environment. In sum, theory-based behavioral research can help define the level, type, and content of interventions to promote healthy eating.

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Biographies

Dr. Susan E. Middlestadt

Dr. Middlestadt is an Associate Professor in the School of Public Health, Indiana University, Bloomington, IN. She conducts applied research to help design and evaluate theory-based and empirically-grounded health promotion, communication, and social marketing programs. Her interests include behavioral, evaluation, and intervention research on physical activity and nutrition behaviors underlying obesity and other chronic diseases. Her research has supported the development of social and behavior change programs for school-aged youth, young adults, women and men of reproductive age, and older adults in the United States and in developing countries. She has worked in community, school, clinic, worksite, and mass media settings. Dr. Middlestadt teaches courses to prepare students to use models and theories of health behavior and to design health interventions.

Dr. Laurel D. Stevenson

Dr. Stevenson received her PhD in Health Behavior and her Master of Public Health degrees from Indiana University and she did her undergraduate work at the University of Michigan. Her research interests include mechanisms to build community capacity, participatory and qualitative research methods, theories of health behavior, and maternal/child health. She currently works as an independent research consultant.

Chia-Ling Hung

Ms. Hung is a doctoral student in the PhD program in Health Behavior, School of Public Health, Indiana University, Bloomington, IN. She holds a Masters in Physical Education from the National College of Physical Education and Sports, Taiwan. For her dissertation, she is conducting a meta-analysis of behavior change campaigns in healthy eating, physical activity, tobacco prevention, and other health behaviors to investigate the role of social marketing principles and techniques in making behavior change interventions more effective.

Dr. Maria Leia Roditis

Dr. Roditis received a PhD in Bioanthropology, a Master of Public Health, and a MA in Anthropology, all from Indiana University. She uses an interdisciplinary social science perspective to research and address health issues. She has studied the environmental, historical, and social factors that affect rates of overweight and obesity among populations of adolescents in Greece. She is currently a Postdoctoral Research Fellow at the Center for Tobacco Research and Education, University of California, San Francisco, CA.

Dr. Alyce D. Fly

Dr. Alyce D. Fly is an Associate Professor of Dietetics and Nutrition Science at Indiana University. Her research laboratory explores the effects of meal patterns on vascular health in healthy and overweight people, and factors that contribute to childhood obesity. She teaches courses in advanced nutrition and human metabolism, and food chemistry and leads a weekly research seminar.

Dr. Jylana L. Sheats

Dr. Sheats received a PhD in Health Behavior from Indiana University and a Master of Public Health from the Tulane University, School of Public Health and Tropical Medicine,

New Orleans, LA. Her research focuses on the psychosocial, behavioral and environmental determinants of physical activity and healthy eating and the impact of contextual factors on the health outcomes of minority and aging populations. She is currently a Postdoctoral Research Fellow, Stanford Prevention Center, Stanford University, School of Medicine, Stanford, CA.