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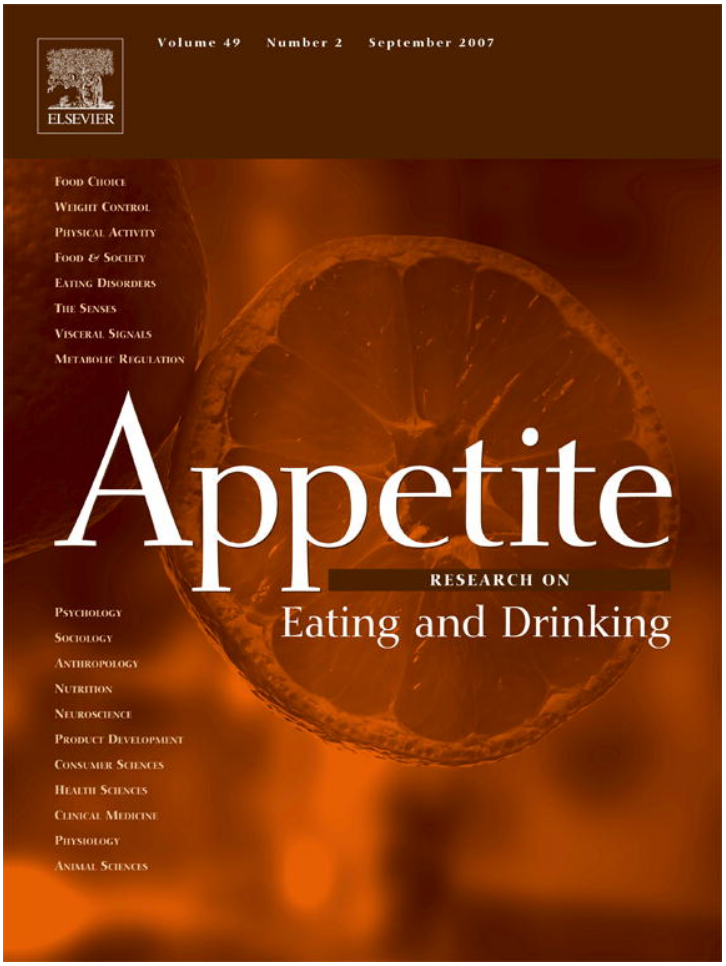

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Short communication

Structure of food attitudes: Replication of Aikman, Crites, and Fabrigar (2006)

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Abstract

Recent research by Aikman, Crites, and Fabrigar [(2006). Beyond affect and cognition: Identification of the informational bases of food attitudes. *Journal of Applied Social Psychology, 36*, 340–382] suggests that food attitudes are comprised of five distinct informational bases: positive affect (e.g., calm, comforted), negative affect (e.g., guilty, ashamed), abstract cognitive qualities (e.g., healthy, natural), general sensory qualities (e.g., taste, smell), and specific sensory qualities (e.g., salty, greasy). The Aikman et al. (2006) research was conducted at a university on the US–Mexican border and consisted primarily of self-reported Latino participants. The present research replicates the previously identified food attitude structure at a university in the Northeast US with a sample primarily composed of self-reported Anglo American participants.

Keywords: Food preferences; Attitudes; Informational bases; Cultural differences

Introduction

Attitudes are evaluations (like/dislike) of items (e.g., foods) that summarize information regarding those items (e.g., healthiness, taste). Research has demonstrated the usefulness of examining the information underlying attitudes (i.e., attitudinal bases). For instance, attitudes are more predictive of behavior when the salient attitudinal base matches the nature of the behavior (e.g., Millar & Tesser, 1986, 1989) and persuasive appeals may be more effective if the content of the appeal matches the attitudinal basis (e.g., Edwards, 1990; Fabrigar & Petty, 1999). Research has focused on affective (feelings associated with an attitude object; e.g., happy, annoyed) and cognitive (beliefs associated with an attitude object; e.g., safe, useless) attitudinal bases. Although these bases are useful because they can be applied to any type of attitude object, they do not preclude the possibility that some sets of objects, such as food, may be composed of information beyond this traditional conceptualization of affect and cognition. In fact, although affective and cognitive bases of food attitudes have been identified (Letarte, Dubé, & Troche, 1997), research on food selection/preference suggests additional pieces of information that are important (e.g., sensory appeal, natural content, price, weight control, familiarity; Roininen, Lähteenmäki, & Tuorila, 1999; Steptoe, Pollard, & Wardle, 1995).

Aikman, Crites, and Fabrigar (2006) conducted two studies to systematically identify the informational bases of food attitudes. The findings suggest that food attitudes are comprised of five distinct bases: positive affect (e.g., calm, comforted), negative affect (e.g., guilty, ashamed), abstract cognitive qualities (ACQ) (e.g., healthy, natural), general sensory qualities (GSQ) (e.g., taste, smell), and specific sensory qualities (SSQ) (e.g., salty, greasy). This five-factor food structure was a better description of food attitudes than a more traditional affective/cognitive attitude structure.

Culture and ethnic groups are important determinants of food preference and choice (e.g., Rozin, 1996). For instance, differences in availability of/exposure to a food across cultures mirror differences in attitudes toward the food (e.g., Zellner, Garriga-Trillo, Rohm, Centeno, &

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Parker, 1999). Further, information that is most important for determining food preferences differs across cultures (e.g., Pettinger, Holdsworth, & Gerber, 2004; Roininen et al., 2001; Rozin, Fischler, Imada, Sarubin, & Wrzesniewski, 1999; Rozin, Kurzer, & Cohen, 2002). Americans are more concerned about fat when thinking about food as compared to French and Indians (Rozin et al., 2002); English (compared to French) people are more concerned with ethical issues and convenience, and French (as compared to English) people are more concerned with pleasure and social aspects of eating (Pettinger et al., 2004).

Given the importance of culture, the present study investigates if the attitude structure identified in Aikman et al. (2006) replicates in a different population. The Aikman et al. studies were conducted at the University of Texas at El Paso, a campus located along the US–Mexican border and composed largely of Hispanic students (approximately 72% Hispanic and 10% Mexican nationals). The present study was conducted at Syracuse University, a campus located in the Northeast US and composed of approximately 80% Anglo American students. This study is necessary because, unlike research examining the informational bases of attitudes more generally, the five-factor food attitude structure does not have a long history and therefore needs to be replicated in various populations.

Methods

Participants

Participants were 247 (96 males, 146 females, and 5 who did not report their gender) undergraduate introductory psychology students from Syracuse University who participated as partial fulfillment of a course requirement. Participants ranged in age from 17 to 25 years ($M = 19.0$, $SD = 1.2$) and were primarily Anglo-Americans (76.5%).

Materials

The materials used in this study were identical to those used in Study 2 of Aikman et al. (2006), and a detailed description can be found there.[1] Briefly, the questionnaire consisted of several bipolar scales on which foods were rated (apples, broccoli, chocolate cake, chorizo, cottage cheese, spaghetti).[2] Because roughly 76% of the sample either did not respond to any of the questions regarding chorizo or always responded with the mid-point of the scale (''undecided''), chorizo was excluded from all analyses. The first section of the questionnaire consisted of three 7-point bipolar scales for rating overall attitude (like/dislike, positive/negative, good/bad). The next section consisted of 46 items assessing positive affective reactions, negative affective reactions, abstract cognitive information, general sensory information, and specific sensory information (see Table 1 for a listing of the factor items). Each item was embedded in one of seven possible statements. The affective items were each presented in one of two statements: ''I feel *lively* when I eat APPLES,'' or ''The thought of eating APPLES makes me feel *comforted*.'' The other items were embedded in one of five statements: ''I consider APPLES to be *healthy*,'' ''I think APPLES are *convenient*,'' ''I believe that APPLES are *fattening*,'' ''I like the *texture* of APPLES,'' ''I think the *appearance* of APPLES is positive.'' Each statement was presented with a 5-point bipolar scale labeled ''agree strongly, agree, undecided, disagree, disagree strongly.'' A few ancillary measures were also included for exploratory and/or descriptive purposes and will not be discussed further.

Procedure

Participants took part in this study during a mass testing session that took place in connection with their introductory psychology course. Before completing the measures, participants signed an informed consent sheet that explained that they would be asked to rate various foods along several informational dimensions (e.g., taste, smell, cost, healthiness) that may or may not be important for their own attitudes toward foods.

Analyses and results

Confirmatory factor analyses

Five confirmatory factor analyses were conducted (one on each food item) to test the model identified in Aikman et al. (2006). The items specified to comprise each factor can be found in Table 1, which presents the factor loadings for each item across foods. Overall, the items had high factor loadings; however, consistent with the previous studies, the items loading most highly on any given factor differed across foods. For example, the ACQ item loading most highly for chocolate cake and spaghetti was healthy, for cottage cheese—nutritious, and for apple and broccoli—natural.

The correlations among the factors were moderate to high across most foods. ACQ and SSQ were significant ($\alpha = 0.05$) and negative (range = −0.45 to −0.81; except for chocolate cake which was significant and positive, 0.72). ACQ and GSQ were significant and positive (range = 0.23–0.72; except for chocolate cake which was significant and negative, −0.25). ACQ and positive affect (PAF) were significant and positive (range = 0.22–0.55). ACQ and negative affect (NAF) were significant and negative (range = −0.36 to −0.72; except for chocolate cake which was non-significant, −0.09). SSQ and GSQ were significant and negative (range = −0.31 to −0.55; except spaghetti which was non-significant, 0.00). SSQ and

[1] Dietary restraint, which was assessed in the Aikman et al. (2006) studies, was not measured.

[2] The foods were chosen so that there would be an item from each Food Pyramid group: broccoli (vegetable), apple (fruit), cottage cheese (dairy), chorizo (savory fat item), chocolate cake (sweet fat item), and spaghetti with tomato sauce (bread/grain).

Table 1
Results of the confirmatory factor analyses for each food item

	Apple	Broccoli	Chocolate cake	Cottage cheese	Spaghetti
PAF					
Lively	0.75	0.79	0.72	0.78	0.67
At ease	0.75	0.84	0.74	0.84	0.81
Joyful	0.77	0.85	0.71	0.76	0.80
Relaxed	0.74	0.78	0.69	0.78	0.75
Calm	0.62	0.72	0.70	0.71	0.78
Comforted	0.73	0.80	0.65	0.70	0.82
Enthusiastic	0.74	0.83	0.72	0.84	0.77
Excited	0.71	0.79	0.64	0.85	0.78
Refreshed	0.58	0.79	0.56	0.76	0.70
Content	0.68	0.70	0.68	0.77	0.61
Satisfied	0.58	0.65	0.67	0.81	0.66
Rewarded	0.62	0.54	0.58	0.78	0.64
NAF					
Guilty	0.71	0.60	0.52	0.37	0.59
Ashamed	0.70	0.67	0.53	0.47	0.58
Depressed	0.78	0.70	0.70	0.54	0.73
Concerned	0.51	0.46	0.55	0.45	0.67
Disturbed	0.73	0.82	0.72	0.81	0.70
Disgusted	0.83	0.82	0.76	0.85	0.85
Sluggish	0.49	0.60	0.37	0.51	0.42
Nauseated	0.70	0.81	0.60	0.88	0.81
Bored	0.20	0.41	0.49	0.41	0.65
Sick	0.65	0.86	0.65	0.92	0.80
ACQ					
Healthy	0.70	0.63	0.86	0.71	0.78
Lean	0.24	0.47	0.67	0.61	0.54
Light	0.41	0.52	0.44	0.64	0.50
Nutritious	0.70	0.63	0.80	0.77	0.65
Safe	0.47	0.64	0.23	0.49	0.30
Traditional	0.39	0.52	0.16	0.42	0.08^{ns}
Natural	0.80	0.67	0.45	0.63	0.37
Familiar	0.75	0.58	-0.02^{ns}	0.51	0.24
GSQ					
Taste	0.66	0.84	0.83	0.92	0.77
Smell	0.51	0.63	0.79	0.79	0.71
Texture	0.66	0.77	0.56	0.85	0.73
Flavor	0.74	0.84	0.70	0.92	0.83
Temperature	0.41	0.65	0.43	0.66	0.43
Appearance	0.73	0.66	0.61	0.75	0.78
Filling	0.19	0.33	0.29	0.41	0.38
Preparation	0.50	0.37	0.03^{ns}	0.33	0.37
SSQ					
Sour	0.10^{ns}	0.50	0.68	0.37	0.19
Salty	0.62	0.41	0.65	0.25	0.40
Greasy	0.76	0.77	0.29	0.50	0.30
Messy	0.41	0.51	-0.14^{ns}	0.42	0.07^{ns}
Wet	0.04^{ns}	0.11	0.30	-0.02^{ns}	0.11^{ns}
Heavy	0.36	0.50	−0.28	0.59	0.52
Fattening	0.80	0.69	−0.52	0.60	0.75
Creamy	0.69	0.62	-0.08^{ns}	-0.05^{ns}	0.27

Values shown are standardized factor loadings. Except where noted, all loadings are significantly different from 0 ($p<0.05$).

PAF were non-significant (range = −0.01 to 0.07; except for cottage cheese which was significant, 0.17). SSQ and NAF were significant and positive (range = 0.22–0.82). GSQ and PAF were significant and positive (range = 0.55–0.80). GSQ and NAF were significant and negative (range = −0.38 to −0.85). PAF and NAF were significant and negative (range = −0.20 to −0.57). One interesting correlation to note is the negative one between GSQ and

ASQ for chocolate cake (arguable one of the less healthy food items examined). This likely reflects attitudinal ambivalence regarding chocolate cake: liking chocolate cake for its taste component while disliking it for its healthiness component.

To determine model fit, root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR) values were examined (for descriptions of fit indices and ranges of acceptable fit, see Byrne, 1998; Hu & Bentler, 1998). These fit indices indicate marginal to good fit across most of the foods: the RMSEA values indicate acceptable (apple, broccoli, chocolate cake, and cottage cheese) or marginal (spaghetti) fit for all of the foods, and the SRMR values indicate good fit for two of the five foods (apple and broccoli).

Discussion

The goal of the present study was to replicate the food attitude factor structure identified in Aikman et al. (2006) using a different population. Overall, the results of these analyses are consistent with the findings of Aikman et al. (2006). Importantly, the five-factor food attitude model previously identified was again shown to have acceptable fit across most foods. Further, few differences were found in terms of factor loadings and correlations amongst factors. The pattern of factor loadings for each of the items across foods was consistent with Aikman et al. (2006)—only four items failed to reach significance in the current study that had significant factor loadings in Aikman et al. (traditional did not load significantly on ACQ for spaghetti, preparation did not load significantly on GSQ for chocolate cake, messy and wet did not load significantly on SSQ for spaghetti), and only three items had significant loadings in the current study but not in Aikman et al. (for chocolate cake, traditional significantly loaded on ACQ and heavy significantly loaded on SSQ; for broccoli, wet significantly loaded on SSQ). The pattern of correlations amongst the factors was also similar across studies: all of the correlations that were significant in the Aikman et al. study remained significant in the present study, and three additional significant correlations were found—ACQ and SSQ were negatively correlated for spaghetti, GSQ and ACQ were negatively correlated for chocolate cake, and PAF and SSQ were negatively correlated for cottage cheese in the present study.

The present study constitutes an important step in confirming the structure of food attitudes: the five-factor food attitude model has been replicated in two US cultures suggesting that these five dimensions are important for determining food attitudes across a range of people. Now future research can begin exploring whether there are differences in the importance of these five bases across various foods and across various types of participants. Research has found that the importance of various factors for food preferences can vary across individuals and types of foods (e.g., Martins & Pliner, 2005; Rappoport, Peters, Downey, McCann, & Huff-Corzine, 1993; Roininen et al., 1999; Steptoe et al., 1995), and it is likely that differences would also be found for the informational bases of food attitudes identified in this series of studies. For example, restrained eaters are different from unrestrained eaters in a number of ways that might imply different food attitude bases would be important for them (see Herman & Polivy, 1980)—restrained eaters are more responsive to external cues, such as the smell of foods, and therefore, the specific sensory qualities factor might be most predictive of their food attitudes (e.g., Heatherton, Polivy, & Herman, 1989; Herman & Polivy, 1980). Future research should continue to explore the replicability of the food-specific attitude structure and begin to explore differences in the predictive importance of the informational bases for global food attitudes across foods and individuals.

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