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Socioeconomic Status, Gender, and Diet

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Abstract

Health outcomes like morbidities and death relate to socioeconomic status (SES), or the power and prestige related to social classes. Many of such outcomes can also be attributed to diet, which SES and gender have been related to. The current study sought to discover factors relevant to dietary behaviors like ground meat preference and motives like the importance of food price, nutrition, naturalness, and convenience. Does SES predict a preference for ground turkey; the importance of food price; nutrition; and naturalness? Does gender predict the importance of food nutrition, naturalness, or convenience? A survey measured participants' levels of education and dietary motives, research assistants observed and coded gender, and income levels were based on the supermarket areas' household incomes. A total of 308 consumers were recruited from supermarkets in northern NJ. The predominant data analytic technique was binary logistic regression. Education predicted the importance of food price ($p < .005$). Being female predicted the importance of food nutrition ($p < .05$). Educated persons of heightened SES were less concerned with food price's importance, which suggested that food price may hinder food habits for the uneducated or impoverished. Furthermore, feminine socialization and reinforcement processes possibly drove the importance of food nutrition for women, perhaps in pursuance of bodily thinness. These findings indicated that SES was related to consumers' spending capacities and gender socialization processes seem to promote nutrition for women. Implications were discussed and future studies were recommended.

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Psychosocial Factors and Diet

Social inequality has been known for some time to impact health. For instance, in mid-19th century England, sooner average ages of death were established among tradesmen/working class compared to the gentry (Chadwick, 1842, as cited in Ragin, 2018). The working class and tradesmen were much more likely to experience hazardous conditions related to work—especially as society was becoming more industrialized—while the gentry were distant to danger, safter. One can see that environmental conditions could vary according to social class and shape health. Relatedly, socioeconomic status (SES) was considered the power, respect, prestige, and honor related to societal class (Newman, 2014). In psychology, SES was often measured using income and education among other housing and occupational elements (Sapolsky, 2004; Gallo & Matthews, 2003; Mathews & Gallo, 2011). Generally, SES was a broad and multidimensional construct that described a person's placement in society relevant to others based upon financial and social standing.

Socioeconomic status has affected health. Independent of heritability, SES was related to intelligence quotient (IQ) scores, presumably because as SES increases, so did one's access to intellectually stimulating environments (Funder, 2013). Intellectual disability was characterized by low-IQ scores and might be more prevalent among the socioeconomically disenfranchised, for example. Furthermore, longitudinal research has suggested that low-SES families had more depression and anxiety among their 15–21-year-old children (Miech, Caspi, Moffitt, Wright, & Silva, 1999). Lower socioeconomic conditions also heightened the human stress-response's sympathetic nervous system activation (Sapolsky, 2004), susceptibility to negative thoughts and

emotions (Gallow & Matthews, 2003), as well as hypertension and other morbidities (Marshall & Skafida, 2021). As such, SES seems a critical component towards understanding health.

Diet also affected overall health. In addition to physical inactivity, poor quality of diet was the most notable predictor of chronic illness (National Research Council, 1989). Diet was a domain of behavior relevant to health, especially as related health issues, like obesity, became increasingly prevalent. Obesity, for instance, is a pandemic closely related to cardiovascular disease (CVD), type two diabetes mellitus (T2DM), and cancer, all surmounting causes of death in the 21st century (Kopp, 2019). Testifying to such surges in the US, compared to baseline measures from 1999-2000, prevalence rates for T2DM significantly increased 2.9% and abdominal obesity significantly increased 9.8% in 2013-2014 (Caspard et al., 2017). To counteract the preponderance of diet-related, chronic morbidities and mortality, one needed to understand diet to change it and its subsequent outcomes.

Food habits predicted numerous health issues like CVD, cancer, osteoporosis, dental diseases, as well as obesity—likely attributable to the declination of typical activity and fitness levels since the mid-20th century (Marks, Murray, Evans, & Willig, 2000). In 1998, the US' average consumption of calories continued to exceed daily requirements, and an estimated excess of two-thirds of the population could be considered overweight (Abelson & Kennedy, 2004). With such blatant social issues, research is needed to identify the origin, nature, and continuation of specific food habits, some of which can prompt negative health outcomes.

Might SES have affected some health-promoting, dietary behaviors? Some findings suggest so. Years of completed education correlated with consumption of grains, fruits/vegetables, and low-fat dairy (Nayga, Tepper, & Rosenzweig, 1999). Relatedly, grains, fruits, and skim milk were three specific foods found to compose low-fat diets (Kennedy,

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Bowman, & Powell, 1999), which promoted weight loss when compared to typical diets (Tobias

et al., 2015). The red meat, beef, is another food that has shown a relationship with SES. For

instance, gross annual income predicted the purchase of leaner ground beef (Berry & Hasty,

1982), and high-SES individuals reported overall lower consumption of non-lean ground beef

(Taylor et al., 2012). Fatty meat consumption drove total/saturated fat intake, while leaner red

meats had less saturated fat, and, when ingested as part of a low-saturated fat diet, did not

contribute to risk factors of CVD (Li, Siriamornpun, Wahlqvist, Mann, & Sinclair, 2005). Thus,

SES may be related to healthier, lean/low-fat diets. Prior research has considered neither the

purchase (Berry & Hasty, 1982) nor consumption (Taylor et al., 2012) of ground turkey, a white

meat that is more nutritious than and can substitute for ground beef (Robson, Stough, & Stark,

2016). Thus, it is unclear if SES will predict a preference for ground turkey versus lean/regular

ground beef.

Differing dietary behaviors could have partially resulted from the various attitudes,

values, and motives surrounding diet. One qualitative study sought to uncover factors that

influenced dietary behaviors using focus groups with a facilitator and protocol to ask nutritionists

who worked in supermarkets about how they instilled healthier dietary behaviors among

consumers (Bracken, Ragin, Francavilla, & Wefferling, 2020). "Values" was one factor that

guided nutritionist-consumer interactions (Bracken et al., 2020). Quantitative research also

showed the existence of distinct factors affecting dietary choices, four of which were central to

the current study: price, health/nutrition, natural content, and convenience (Steptoe, Pollard, &

Wardle, 1995).

After taste, cost has been rated the most important determinant of food choice for the US

population (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998), a finding replicated among

college students, too (Hardy, Ejimakor, Amoakon, & Ralph, 2016). Furthermore, research on the

adult population of Finland suggested that food price and familiarity are most important among

the socioeconomically displaced (Konttinen, Sarlio-Lähteenkorva, Silventoinen, Männistö, &

Haukkala, 2013). The prior report stated that the importance of food price was negatively

associated with education and income (Konttinen et al., 2013), and income was related to price in

a study of the US population's diet (Glanz et al., 1998). However, it remains unclear to what

extent education predicts the importance of food price, in addition to income.

Another suggestion of SES's connection with values related to diet emerged in fast-food.

Fast foods include large amounts of chemical additives (Freeman, 2007), which conflicts with

the dietary motive of food naturalness (Steptoe et al., 1995). Also, patrons of fast-food

restaurants are typically uninformed regarding their meals' nutritional contents (Freeman, 2007),

which does not coincide with the dietary motive of health's basis on nutrition (Steptoe et al.,

1995). Furthermore, according to a study period of three weeks, the wealthiest fifth of the US

population reported 54.6% the likelihood of fast-food consumption as the poorest (Zagorsky &

Smith, 2017). Collectively, these findings suggest SES is related to the importance of food

naturalness or nutrition, but whether community-level SES can predict individual values related

to food naturalness or nutrition has not been empirically evaluated.

Gender is one pervasive, social element emanating from birth. Social constructionism

argued that learning and development of behavioral knowledge such as that related to gender

relied upon symbolic and psychosocial interaction to inform reality (Agrawal, 2008; Ravé, Pérez,

& Poyatos, 2007; Mackie, 1990; Marecek, Crawford, & Popp, 2004). Social constructionism

reflected aspects of social learning/cognitive theory, which similarly declared observation,

reinforcement, and imitation (Ragin, 2018) as the buttresses of learning and norm internalization.

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Might gender have promoted unique socialization processes and experiences that shaped behaviors? Over time, male- and female-bodied persons were pressured to behave consistent with masculine and feminine ideals in society, respectively, suggesting accumulation of gendered experiences that could shape knowledge and behavior. Research also seemed to indicate that the female's socialization processes produced unique outcomes such as reduced self-esteem, memorial emotionality, and affiliative versus intrusive verbal interruption (Etaugh & Bridges, 2017). Gender relations also revealed gender's production of social architecture that organizes, contextualizes, and institutionalizes femininities and masculinities (Pascoe & Bridges, 2016), a predominant form of which suggested that men are socially and culturally reinforced to be autonomous and assertive. Hence, experiences related to both sides of the gender binary may have subsequently affected behaviors.

Did gender share a relationship with factors related to dietary choices? Women seem pressured with conformity to stringent dietary behaviors, as being female was related to an overall increased likelihood of having an eating disorder in the lifetime (Galmiche, Déchelotte, Lambert & Tavolacci, 2019), buying organic foods (Onyango, Hallman, & Bellows, 2007), and importance of food nutrition (Glanz et al., 1998) and naturalness (Román, Sánchez-Siles, & Siegrist, 2017). Thus, could both SES and femininity could relate to the importance of food nutrition and naturalness? Furthermore, the notion that men may be more assertive and autonomous suggested they may also value their personal independence and efficiency. Similarly, qualitative research (Bracken, 2020) also indicated that men value convenience. Namely, during one focus group, a nutritionist stated that "men want convenience, and . . . [they will] pay for it" (Bracken, 2020, p. 22). Thus, the importance of food convenience could be masculinized.

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The Current Study

Prior research concluded that SES may affect the purchase and/or consumption of ground beef (Berry & Hasty, 1982; Taylor et al., 2012), but ground turkey was not addressed. Ground beef was a red meat with higher fat content, as lean ground beef must contain equal to or lesser than 10% fat (Gattuso et al., 2016; Glanz, Sallis, Saelens, & Frank, 2007). Ground turkey was a white meat that could easily substitute ground beef for persons with more stringent diets, in dishes like meatloaf/balls and hamburgers (Robson, Stough, & Stark, 2016). According to inexperienced consumers, ground turkey scored no differently from beef in terms of taste, acceptability, flavor, nor tenderness when prepared as a taco filling (Holben & Holcomb, 2000). Income and education's potential associations with a preference for ground turkey over beef may expose a socioeconomic bias in diet. Elaborating further, if income or education do relate to a preference for ground turkey, it could suggest that high-SES individuals may be more open to the suggestion of replacing ground beef with turkey in prepared dishes. It could also indicate that people from lower socioeconomic conditions may have an ambivalence towards ground turkey, as it may be unfamiliar, and that potential exposure to the ingredient, possibly with sampling, could assuage their preference for beef.

Increasing food prices negatively related to circumference of the waist, weight, and obesity (Lee, Ralston, & Truby, 2011). Earners of low-to-moderate incomes have suggested that nutritious diets are unaffordable (Lee, Ralston, & Truby, 2011). The aforementioned research may have connected SES, food price, and health. Food price has been identified as one of the most important factors contributing towards food choices (Hardy et al., 2016; Glanz et al., 1998), making it a potentially impactful variable to further study. Low-income and lesser educated persons from Finland rated food price as most important (Konttinen et al., 2013), but only

income predicted the importance of food price in the US, as education was not targeted (Glanz et al., 1998). Income and education were two highly interdependent factors subsumed by SES (Sapolsky, 2004; Gallo & Matthews, 2003; Mathews & Gallo, 2011), but separately examining both as key factors in the prediction of food price's importance may reveal unique, noteworthy findings. For instance, it could be that a person's available, fiscal spending (i.e., income) could directly impact whether they consider expensive foods to be noteworthy. Conversely, if education shared a relationship with the importance of food price, it may suggest not that income directly affects how important food cost is, but that the values that shape food choice among educated people may differ from those without such qualifications.

Consistent with the notion that females' diets may be more controlled or restrictive, being female has been associated with both the importance of food nutrition (Glanz et al., 1998) and naturalness (Román et al., 2017). Although heightened fast-food consumption, which may indicate low importance of food nutrition/naturalness, among people from lower socioeconomic backgrounds may be attributable to overabundance of fast-food in poorer environments (Freeman, 2007), it remained possible that SES was negatively associated with the importance of food nutrition and naturalness, too. Food naturalness' importance relates positively to eating healthy foods and negatively to eating unhealthy foods (Román et al., 2017). Nutrition broadly addressed the nutrients and nourishments that the body uses to grow and maintain health, making its importance a notable target to study as a contributor to overall health. Thus, both gender and SES will be used in the prediction of the importance of food nutrition/naturalness. If either gender or SES shared a relationship with food nutrition or naturalness' importance, it would expose motivational discrepancies among men and women and/or high- and low-SES

individuals. If gender, education, or income relate to such dietary motives, it could inform future interventions to support the importance of these motives, both of which could improve health.

Gender is socially constructed and affects behavior. As suggested by gender relations, society's production of social architecture reinforced traditionally masculine and feminine standards in behavior for males and females, respectively (Pascoe & Bridges, 2016). Based upon Western traditions, the typical form of masculinity suggests that men are assertive and value efficiency. Furthermore, qualitative research suggested that males might value convenience when shopping for foods (Bracken, 2020, p. 22). If food convenience is masculinized, that is, if men consider it to be more important, there may practical implications. Future studies or programs may wish to make the convenience of specific foods more salient for male consumers. For instance, households' males who are often busy or have hectic jobs can benefit from readily consumable and nutritious foods such as microwaveable pouches of grains like quinoa, according to one nutritional expert's qualitative account from the theme, "cultural preferences" (Bracken, 2020). A future study attempting to make healthy grains more accessible to men with microwaveable bags may wish to emphasize the product's ease and hastiness of preparation, for example.

Informing the current study were the following predictions: income and education will predict a preference for ground turkey versus either standard or lean ground beef; income and education will predict the importance of food price; income, education, and being female will predict the importance of food nutrition/naturalness; and males will more highly rate the importance of food convenience.

Methods

Supermarkets

The current paper expanded upon a prior study of supermarkets' foods in neighborhoods in northern NJ (Gattuso et al., 2016). Delineating supermarkets into three levels of income using data from the US Census Bureau, the supermarkets located in zip codes where median household incomes ranged from $16,000-$36,00 were categorized as low-income, between $70,000-$111,000 were categorized as moderate-income, and $133,000 or greater were classified as high-income (Thompson & Hickey, 2004, as cited in Gattuso et al., 2016). Only areas of northern NJ with median household incomes that fell within such ranges could have eligible supermarkets to compose the stratified random sample (Gattuso et al., 2016). The number of supermarkets per strata and their incomes' medians (Ragin, 2014, Table 1) and ranges were described in Table 1.

Participants

With permission from Montclair State University's Institutional Review Board, while collecting food data from supermarkets in northern NJ, adult consumers exiting supermarkets were recruited to participate in a survey. Data collection from participants varied according to the number of supermarkets by income level and their available participants. In total, 308 adults provided survey data between 2014-2015 by completing most of its items (Ragin, 2015). The majority of participants lived in the same municipality within which their supermarket was located (85.06%), were female (58.12%), White (47.40%), and 38-47 years of age (26.62%). With 53 out of 147 (36.05%) participants who provided education data, the modal level of education was a college degree. Tables 2-5 showed income by gender, age, education, and ethnic/racial category.

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Procedure

While on-site collecting food data, research assistants also approached every 10th participant leaving supermarkets to orally administer a brief survey using a systematic random sample procedure. All participants verbally provided consent to participate in the survey and confirmed on its first item that they were 18 years of age at minimum. Once adequate age was confirmed, verbal administration of the survey continued in English or Spanish (as participants preferred). No identifying data were collected. The time needed to complete the survey ranged from three to five minutes.

Measures

Gender

Participants did not self-report their gender. Instead, research assistants used observation to code gender as either male or female, the two nominals according to the conventional gender binary.

Ethnoracial Category

The survey asked participants which ethnic/racial group best described them. The nominals, "Asian," "American Indian," "African American," "Hispanic," "White," and "other" were offered. Participants could select only one.

Community-level Income

Income was assessed according to an ordinal-level of measurement. Three strata were delineated according to median household incomes in supermarkets' zip codes. Median household incomes were based on data available from the US Census Bureau (as cited in Gattuso et al., 2016). Low-, moderate-, and high-income supermarkets had incomes ranging from $16,000-$36,000, $70,000-$111,000, and $133,000 or greater, respectively.

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Education

Featuring ordinal-level of measurement, respondents disclosed their highest level of education completed as either "some high school," "high school," "some college," "college," "graduate degree," or "other."

Ground Turkey Preference

An item asked participants to report which meat they were likeliest to purchase. The allowed nominal responses were either ground turkey, lean ground beef, or standard ground beef.

Importance of Food Price, Nutrition, Naturalness, and Convenience

Participants also rated the importance of food price, nutrition, naturalness, and convenience. Each variable featured one item. Each item featured a 3-point Likert scale, implicating ordinal-level of measurement. Participants could select from "not important," "somewhat important," or "important."

Data Analysis

The sample was preliminary analyzed with percentages calculated by hand. Preliminary chi-square analyses assisted in screening the data and describing the sample Four out of the five a priori hypotheses were statistically tested via binary logistic regression, which made it the current study's predominant data analytic technique. A chi-square analysis was also used to test one hypothesis. All data analyses were conducted in IBM SPSS (Version 25), with the only exception being manually calculated percentages.

Results

The first regression model sought to determine whether education and community-level income predicted participants who preferred ground turkey. Note that the "other" response for education was originally allowed, but only 3 out of 150 (or 2.00% of) respondents chose it.

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Hence, this response was disallowed, and those participants' data were omitted and will not subsequently be discussed. One hundred sixty-seven participants were dropped due to not providing both ground meat preference and education level. An additional 18 were dropped because they did not have available community-level income data. Accordingly, 123 participants provided complete data and were included in the analysis. Sixty-seven participants preferred ground turkey, 56 did not. Binary logistic regression predicted participants who preferred ground turkey. Education and community-level income were input as the model's IVs. The addition of the predictors did not lead to significantly improved fit over the baseline model, $\chi^2(2) = 3.31$, $p = .192$; -2 log-likelihood = 166.22 Cox and Snell $R^2 = .03$; Nagelkerke $R^2 = .04$. The overall correct classification rate for the model was 58.54%, with 42.86% of participants who did not prefer ground turkey and 71.64% of participants who preferred ground turkey being correctly classified. Neither education nor community-level income was related to being a participant who preferred ground turkey (details shown in Table 6).

The second regression model investigated whether education and community-level income predicted the importance of food price. Although all participants had provided data for the importance of food price, 49 were dropped due to lacking community-level income data. Another 131 participants lacked education data and were omitted from the analysis. Hence, 128 participants provided complete data and were included in the analysis. Sixty-six participants reported importance of food price, 62 did not. Binary logistic regression was used to predict the importance of food price. The model's IVs were education and community-level income. The addition of the predictors led to significantly improved fit over the baseline model, $\chi^2(2) = 17.09$, $p < .001$; -2 log-likelihood = 160.23; Cox and Snell $R^2 = .13$; Nagelkerke $R^2 = .17$. The overall correct classification rate for the model was 68.75%, with 70.97% of participants who did not

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report the importance of food price and 66.67% of participants who reported the importance of food price being correctly classified. Community-level income was not related to importance of food price. Education, however, was related to the importance of food price; each of its units was associated with 0.52 times the odds (95% CI: 0.34-0.79; details shown in Table 7).

The third regression model tested if gender, education, and community-level income predicted the importance of food nutrition. All participants had gender coded, but 49 and 131 participants were dropped due to lacking community-level income and education data, respectively. One hundred twenty-eight participants provided complete data and were included in the analysis, 82 reported importance of food nutrition, 46 did not. Binary logistic regression predicted the importance of food nutrition. The model's IVs were gender, community-level income, and education. The addition of the predictors led to significantly improved fit over the baseline model, $\chi^2(3) = 9.30$, $p = .026$; -2 log-likelihood = 157.88; Cox and Snell $R^2 = .07$; Nagelkerke $R^2 = .10$. The overall correct classification rate for the model was 65.63%, with 17.39% of participants who did not report the importance of food nutrition and 92.68% of participants who reported the importance of food nutrition being correctly classified. Neither community-level income nor education were related to the importance of food nutrition. However, being female was related to the importance of food nutrition, being associated with 2.26 times the odds (95% CI: 1.07-4.79; details shown in Table 8).

The fourth regression model was like the third in that it tested whether the same predictors, gender, education, and community-level income, predicted the importance of food naturalness. All participants had gender coded, but (again) 49 and 131 participants were dropped due to lacking community-level income and education data, respectively. One hundred twenty-eight participants provided complete data and were included in the analysis. Thirty-seven

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participants reported importance of food naturalness, 91 did not. Binary logistic regression

predicted the importance of food naturalness. Community-level income, education, and gender

were specified as IVs for the model. The addition of the predictors did not lead to significantly

improved fit over the baseline model, $\chi^2(3) = 2.70$, $p = .441$; -2 log-likelihood = 151.24; Cox and

Snell $R^2 = .02$; Nagelkerke $R^2 = .03$. The overall correct classification rate for the model was

71.09%, with 100% of participants not reporting the importance of food naturalness and 0.00%

of participants reporting the importance of food naturalness being correctly classified. None of

the predictors were related to the importance of food naturalness (details shown in Table 9).

A chi-square test of independence examined whether the importance of food convenience

differed by gender. Sixty-nine males and 81 females rated the importance of food convenience.

Twenty-four males indicated importance of food convenience, 37 deemed it somewhat

important, and eight rated it as not important. Quite similarly, 31 females indicated importance

of food nutrition, 32 rated it somewhat important, and 18 rated it as not important, χ^2 (2, N =

150) = 4.17, $p = .125$. Thus, there was insufficient evidence to support the prediction that males

more highly rated the importance of food convenience.

Discussion

The present study confirmed two notable predictions. Foremost, that the educational

aspect of SES predicts the importance of food price among adult grocery shoppers in the US.

Second, the current paper showed that food nutrition, one motivation of dietary behaviors, was

particularly important to female over male adults in New Jersey. Broadly, these confirmations

remind one that dietary behavior is socially driven. Social class and socioeconomic conditions

may shape an individual's dietary motives, particularly in the case of cost. Furthermore, females'

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socialization processes also inform dietary motives, particularly emphasizing nutrition's importance.

Education and income scores were effective predictors of the importance of food price, overall. While education significantly reduced the odds that food price was deemed important, income had no effect. Education's pertinence over income may have suggested that it was an effective individual-level determinant of the importance of food price. Food price may have been a more critical factor or a barrier to socioeconomically disenfranchised people by means of education. For instance, a person from a lesser SES background might have had more economic constraints, and, therefore, may have more highly considered the importance of price in relation to food purchases. These results are also consistent with other scholarly work suggesting that the importance of food price is socioeconomically related, specifically via income and education (Konttinen et al.,, 2013). Wealthier individuals have previously shown less concern with food price (Steptoe et al., 1995), so community-level income's failure to predict its importance contradicts with such precedent. However, income was assessed via strata, at the community-level, so its failure to predict the importance of food price may be attributed to median household income not guaranteeing personal income. These findings can inform future studies or interventions among educated populations, who may not be as influenced by food price compared to others.

The feminization of the importance of food nutrition was also noteworthy. Females had over two-fold the odds of finding food nutrition to be important compared to males. These results also replicated prior findings regarding the importance of food nutrition to females (Glanz et al., 1998). Gender's relevance may have indicated discernable sociocultural influence in the production of gendered dietary behavior in the case of nutritional importance. Female nutritional

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experts in Japan have promoted bodily thinness in the female body via diet (Kimura, 2011), which may suggest that, for women, food nutrition is a means to achieve a bodily standard consistent with dominants ideologies. More research is needed to examine what specific aspects of socialization related to gender drive women's importance of nutrition. For instance, it is unclear when this importance emerges. Furthermore, it is also unclear what specific actions or activities among or enacted upon females drive nutrition's relevance. A future study may wish to consider how and why females under the age of 18 may relate nutrition to the female body. Future applied or empirical research may also wish to emphasize the importance of food nutrition for men, who could benefit from its health benefits.

It is worth emphasizing that SES did not appear to relate to most of the predicted dietary motives nor ground turkey preference. Socioeconomic status, as assessed by community-level income and individual-level education, was not established as a contributor to the preference for ground turkey. Recall, neither education nor community-level income units were associated with statistically significant odds of being a participant of who preferred ground turkey. It is possible that instead of only asking participants what type of ground meat they preferred, but also describing the healthier options typically increased prices, could have assuaged the excessive preference for ground turkey—as over half of the respondents reported preferring ground turkey. Also, as SES was neither related to the importance of food nutrition nor naturalness, it suggests that these dietary motives are not informed by education and income. It is possible that increased fast-food consumption among the poor may be more related to its affordability coupled with environmental saturation of fast-food locations in low-income areas. That is, the explicit, dietary motives, the importance of food nutrition and naturalness, may not be taken into account by socioeconomically disenfranchised people, who may be more affected by their fiscal limitations

and environmental influences when eating, instead. Further research inquiry would need to ascertain such possibilities, however. Furthermore, it is also possible that the analyses, in focusing on individual-level determination of dietary motives, failed to address some critical environmental aspects related to SES and shaping specific dietary behaviors.

The hypothesis that males more highly rated the importance of food convenience was disconfirmed. In fact, a slightly greater overall percentage of females deemed food convenience as very important compared to males. As Western societies, such as that of the US, have become more egalitarian and flexible in roles of gender, it may have been that the forces that traditionally pressured men to be assertive and efficient now similarly applied to women. As such, men and women seem to equivocally value convenience when it comes to foods.

Limitations

The current study was a secondary data analysis of prior work (Gattuso et al., 2016), several caveats in the data need to be disclosed. Missing data was one of the most notable complications in the current study. Only age, gender, ethnic/racial category, income, and the importance of food price were assessed for the entirety of the study (Gattuso et al., 2016). The survey was modified after an initial phase to include education, ground meat preference, and the importance of food nutrition, naturalness, and convenience, which approximately halved the sample size for analyses including said variables. Also, income data were unavailable for 49 participants, 46 due to not living in the same municipality as the supermarket. The rationale for excluding participant income data when they did not live in the same municipality as the supermarket was that it was inappropriate to assign someone an income level based on their supermarket when they acknowledged living elsewhere. The additional three participants were omitted because one supermarket's income data was not coded during data entry (Ragin, 2014,

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Table 1). However, after having omitted the 49 participants due to lacking income data, a chi-square goodness-of-fit test revealed no statistically significant differences in participant frequency by income, χ^2 (2, N = 259) = 1.907, p = .385. In further detail, recruitment from low-, moderate-, and high-income supermarkets yielded 85, 96, and 78 participants, respectively. The prior chi-square test suggested that those low-, moderate-, and high-income populations were not unequal.

Most of the dependent variables (DVs)—specifically, the importance of food price, nutrition, naturalness, and convenience—originally featured ordinal-level of measurement. However, the hypothesis that males would more highly rate the importance of food convenience implicated only two variables. Regression models typically feature several independent variables (IVs), and, thus, were unsuitable. Since testing for an association between gender and the importance of food convenience was to feature a test other than regression, its three levels were retained, and a chi-square analysis was chosen. Ordinal logistic regression was the intended statistical technique for all other DVs. However, ordinal logistic regression models' parameter estimates may be negatively impacted by categorical infrequency and small cell counts (Bixter, 2020). As a testament to unequal participant frequencies across the DVs' three levels, indicative of some degree of infrequency or small cell count, the importance of food price, nutrition, and naturalness were separately analyzed with a series of chi-square goodness-of-fit tests. Testing revealed significant differences in participant frequencies by levels of the importance of food price, $\chi2$ (2, N = 308) = 46.68, nutrition, $\chi2$ (2, N = 150) = 86.52, and naturalness, $\chi2$ (2, N = 150) = 13.96, all ps < .001. The importance of food price, nutrition, and naturalness showed unequal populations across their levels, which suggested benefit of redress. Specifically, to reduce the unequal spread of participants across three levels, data were reduced into two levels.

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Hence, those three DVs were collapsed into binary outcomes such that low and neutral/moderate scores were recoded into negative outcomes and high scores were recoded into positive outcomes. Binary logistic regressions were used in lieu of the intended ordinal variety.

The only remaining DV, ground turkey preference, also had three outcomes, but the variable was multinomial, that is, its data laid at the nominal-level of measurement. Recall, participants could select if they preferred ground beef, lean ground beef, or ground turkey. Participants who preferred ground turkey were coded positively while participants who preferred standard or lean ground beef were coded negatively. Thus, binary logistic regression was used to predict the preference for ground turkey.

Another limitation was that data were somewhat dated, as they originated from 2014-2015. It remained possible thar supermarket consumers' behaviors, thoughts, and feelings may have changed since data collection. For instance, today's supermarket consumers could have expressed greater importance of food nutrition and naturalness as, perhaps, novel research has emerged connecting them to well-being.

Additionally, the current study was a secondary data analysis. The CSUS was designed and implemented according to prior study (Gattuso et al., 2016). Thus, while the current study may have adjusted the wording of some items or kept forms entirely consistent between the first and second phases of data collection, redress was impossible.

Furthermore, the stratified random sample of supermarkets suited study of food environments (Gattuso et al., 2016). However, this may have limited the implications of individual-level analyses. More specifically, income was determined according to median household incomes for supermarkets' zip codes, but this was not the most parsimonious way to designate a person's income. It would have been more ideal to geographically stratify

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supermarkets across areas of northern NJ, randomly sample them, then ask CSUS respondents to provide their annual net incomes, instead. Even only allowing income scores when the participant lived in the same municipality as the supermarket was not a theoretically impervious correction, as someone living in the same municipality as their supermarket may have lived in a differing zip code with a differing median household income because municipalities could have contained several zip codes. Also, not every resident's household income may have been accurately captured by census data.

An additional point worthy of disclosure was an overall small sample size of 308 total participants. The relatively small sample size, coupled with the fact that some variables were only assessed during one phase out of two, which nearly further halved the sample size for some analyses, limited the statistical analyses appropriate. While small sample size was redressed using non-parametric statistics via binary logistic regression models and chi-square analyses, such non-parametric statistics have featured reduced statistical power, which can lessen the probability of finding an effect when it truly existed.

Conclusion

The current study successfully identified some motives of dietary behaviors, which can disentangle the ambiguity surrounding their related outcomes. Specifically, food price's importance might only negatively affect the diets among the socioeconomically disenfranchised. While this finding can inform research on highly educated individuals to reinforce other motives instead, lesser educated individuals' dietary behaviors may be moderated by fluctuating food prices. Perhaps social policies can reduce some food prices to improve diets of the uneducated, who seem to consider food price more importantly that the educated.

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Lastly, there seemed to exist at least one aspect of females' socialization processes that reinforced the importance of food nutrition, an outcome not espoused by males. While the social activity or activities that drove the importance of food nutrition for women are not the target of the current study, nor was it clear when such importance emerged, it was possible that food nutrition was thought to be a pathway to bodily thinness for women to conform to thin and idealized bodily images. Future studies may wish to emphasize the importance of food nutrition for men so they also can benefit from nutrition, or to uncover when and why it specifically seemed to impact women.

Socioeconomic status, however, did not impact many of the targeted dietary motives. Nor did SES affect preference for ground turkey. It was possible that SES' relationship was more complex than the analysis allowed by focusing on community-level income, the individuals' levels of education, and their motives. More research would need to examine how SES impacts one's environmental access to foods to further disentangle how SES might be relates to dietary behaviors.

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Appendix A: Description of Sample

Table 1

Supermarkets and Descriptions of their Income Levels

	Frequency	%	*Mdn*	Range
Low-Income Supermarkets	6	35.29	27,404	13,472
Moderate-Income Supermarkets	5	29.41	93,688	38,601
High-Income Supermarkets	6	35.29	152,750	42,213

Note. Income levels' *Mdn*s and ranges expressed in whole US dollars.

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Table 2

Gender by Income in Percentages (N = 259)

	Female	Male
Low-Income	55.29	44.71
Moderate-Income	64.58	35.42
High-Income	58.97	41.03

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Table 3

Age Range by Income in Percentages (N = 259)

	18-27	28-37	38-47	48-57	58-67	68-77	≥ 78
Low-Income	23.53	20.00	22.35	20.00	8.24	3.53	2.35
Moderate-Income	10.42	12.50	29.17	15.63	15.63	12.50	4.17
High-Income	6.41	24.36	26.92	15.38	12.82	8.97	5.13

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Table 4

Education by Income in Percentages (N = 128)

	Some High School	High School	Some College	College	Graduate Degree
Low-Income	16.67	40.00	30.00	10.00	3.33
Moderate-Income	1.82	10.91	38.18	34.55	14.55
High-Income	0.00	9.30	9.30	51.16	30.23

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Table 5

Ethnoracial Category by Income in Percentages (N = 259)

	Asian	American Indian	African American	Hispanic	White	Other
Low Income	3.53	2.35	34.12	51.76	3.53	4.71
Moderate Income	5.21	0.00	14.58	17.71	60.42	2.08
High Income	5.13	0.00	15.38	3.85	71.79	3.85

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Appendix B: Table Results

Table 6

Results of Binary Logistic Regression Model that Predicted Participants Who Preferred Ground Turkey ($N = 123$)

	Wald's χ^2	*OR*	*95% CI*
Income	3.12	0.59	0.32-1.06
Education	0.52	1.16	0.78-1.71

Note. OR = Odds Ratio; CI = Confidence interval, $\chi^2(2) = 3.31$, $p = .192$; -2 log-likelihood = 166.22; Cox and Snell $R^2 = .03$; Nagelkerke $R^2 = .04$.

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Table 7

Results of Binary Logistic Regression Model that Predicted the Importance of Food Price

(*N* = 128)

	Wald's χ²	*OR*	*95% CI*
Income	0.28	0.86	0.48-1.53
Education	9.51*	0.52	0.34-0.79

Note. OR = Odds Ratio; CI = Confidence interval. $\chi^2(2) = 17.09$, $p < .001$; -2 log-likelihood = 160.23; Cox and Snell $R^2 = .13$; Nagelkerke $R^2 = .17$.
* $p < .005$

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Table 8

Results of Binary Logistic Regression Model that Predicted the Importance of Food Nutrition

(N = 128)

		Wald's χ²	*OR*	*95% CI*
Income		1.01	1.35	0.75-2.42
Education		1.07	1.23	0.83-1.83
Gender	Female	4.51*	2.26	1.07-4.79
	Male (ref.)	--	--	--

Note. OR = Odds Ratio; CI = Confidence interval. $\chi^2(3) = 9.30$, $p = .026$; -2 log-likelihood = 157.88; Cox and Snell $R^2 = .07$; Nagelkerke $R^2 = .10$.
* $p < .05$

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Table 9

Results of Binary Logistic Regression Model that Predicted the Importance of Food Naturalness

(N = 128)

		Wald's χ^2	OR	95% CI
Income		2.04	1.57	0.85-2.90
Education		0.01	0.98	0.65-1.49
Gender	Female	0.00	1.02	0.47-2.24
	Male (ref.)			

Note. OR = Odds Ratio; CI = Confidence interval. $\chi^2(3) = 2.70$, *p* = .441; -2 log-likelihood = 151.24; Cox and Snell R^2 = .02; Nagelkerke R^2 = .03