



Psychological profiles of people who justify eating meat as natural, necessary, normal, or nice

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ABSTRACT

Research suggests that people tend to use one of four rationalizations to justify eating meat despite its empirically established negative consequences for both personal and societal well-being: the beliefs that meat is *natural*, *necessary*, *normal*, or *nice*. The goal of this study was to better understand what kind of people would tend to use these different rationalizations in terms of their personality traits, values, and motivations for plant-based eating. Results suggest specific psychological profiles for each of the four meat-eating rationalizations. These profiles may be useful for behavior change advocacy and for furthering the basic science of individual differences underlying food preferences and choices. Suggestions for future research that builds upon these initial findings are highlighted.

1. Introduction

Most people continue to eat meat despite the range of benefits of a plant-based diet for individuals and society (Ruby, 2012). Research suggests that the dissonance between this behavior and its consequences is often resolved by a few specific rationalizations (Joy, 2010; Piazza et al., 2015; Rosenfeld, 2018). First, people maintain that it is *natural* to eat meat, meaning that there is a perception that human beings are omnivorous and that deriving nutrients from meat is part and parcel of being human. Second, people think it is *necessary*, meaning that it would be unhealthy to deprive the human body of the nutrients available in meat. Third, people view it as *normal*, meaning that the majority of people regularly eat meat because it is an accepted, and thus acceptable, social custom. Fourth, people perceive it is *nice*, meaning that it tastes good and affords pleasure.

Piazza et al. (2015) showed that these four rationalizations captured more than 80% of open-ended responses to a question asking for three reasons why respondents eat meat. They developed a scale to measure these “4Ns”, whose total score was highly sensitive to vegetarian diet and was significantly correlated in the expected direction with a variety of scales measuring attitudes about animals. Although the 4Ns was designed to measure four distinct albeit interconnected scales, Piazza et al. did not emphasize their possible differential associations with other individual difference variables, in part because the scales were highly correlated with one another. Subsequent work has not focused upon the correlates of different motivations for meat eating. That is the

goal of this study.

Understanding what psychological characteristics are associated with different rationalizations for meat eating could provide important information about the kinds of people who eat meat for different reasons. From the perspective of the science of food choice, it is of interest to connect meat eating motivations to other sets of variables because doing so embeds eating behavior in the broader science of individual differences psychology. From an advocacy perspective, understanding what types of people are more or less likely to use different kinds of rationalizations can guide efforts to change behavior in a targeted fashion. We focused on three individual differences domains: personality traits, values, and motivations *not* to eat meat.

1.1. Personality traits and rationalizations for eating meat

A large literature exists documenting the course, correlates, etiology, and implications of the big five personality traits neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (John & Srivastava, 1999; Widiger & Trull, 2007). This research includes some mixed findings suggesting that the traits agreeableness and openness to experience may be associated with a vegetarian diet (Furnham, McManus, & Scott, 2003; Mathews & Herzog, 1997; Pfeiler & Egloff, 2018a, 2018b). However, no research has identified big five correlates of different rationalizations for eating meat.

Examining these correlates advances food choice science by linking

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eating motives to a large body of findings in the personality literature, thus enabling inferences and hypotheses about the course and correlates of rationalizations for eating meat. Although the literature on meat rationalizations is not sufficient to make specific hypotheses about how traits might relate to the 4Ns, there are reasons to expect associations given the wide range of big five correlates and the specific nature of the traits and rationalizations. For instance, we expected an association between seeing meat eating as normal and relatively lower openness to experience, because people who are low in openness tend to be more comfortable engaging in established and culturally normative behaviors (John & Srivastava, 1999).

1.2. Values and rationalizations for eating meat

Personal values may play a particularly determinative role in food choice preferences in general and rationalizations for meat in particular. For instance, in previous research, conservative values such as power and security tend to be associated with higher preferences for meat whereas liberal values such as universalism tend to be associated with preferences for reducing meat (e.g. Hayley, Zinkiewicz, & Hardiman, 2015). Rokeach (1973) proposed two important types of values that may be useful for distinguishing meat-eating rationalizations. Instrumental values are the means by which long-term goals are met. These include values like hard work, self-control, and loving relationships. Terminal values are the long-term goals an individual strives for, such as family security, mature love, and freedom. Both types of values tended to correlate more strongly with vegetarian motives than personality traits, perhaps because one's diet reflects a motivated behavior (Hopwood, Bleidorn, Schwaba, & Chen, under review). We expected a similar pattern with respect to rationalizations for eating meat. The existing literature is not sufficient to derive specific hypotheses about how values would relate to rationalizations. However, as an example, it might not be surprising to learn that people with hedonic values may tend to eat meat because they think it tastes nice.

1.3. Motivations for eating meat and motivations for not eating meat

Third, we examined motivations for vegetarian diets. Research on the reasons why people refrain from eating meat suggests three primary motivations, especially in Western cultures: individual health, the environment, and animal rights (Rosenfeld, 2019). Understanding how motives to eat more or less meat are related to one another is an important step in developing a broad taxonomy of food choice motives and for better understanding choices related to vegetarian diet. It is natural to expect that, in general, motives to eat more meat would be negatively related to motives to be vegetarian. The literature is not sufficiently developed to make more specific hypotheses, although we might expect that health motives for vegetarian and meat eating might show particularly strong negative associations, given that people who see meat eating as particularly healthy would presumably see vegetarian diets as particularly unhealthy, and vice versa.

1.4. Summary

People use different rationalizations for meat eating, but little is known about the individual differences correlates of those different rationalizations. The purpose of this study was to explore the distinct correlations between 4Ns scales and personality traits, personal values, and vegetarian motivations to better understand the types of people who are more or less likely to justify meat eating based on their perceptions that it is natural, necessary, normal, or nice.

2. Method

Participants were 1004 Amazon MTurk Workers who completed a survey for financial compensation (prorated at \$10/hour). The average

age in this sample was 36.46 (SD = 10.99); 471 (46.91%) were female, 532 (53.00%) were male, and 1 (0.1%) was nonbinary. Ethnic/racial composition was 63 (6.7%) Asian, 113 (11.3%) Black, 111 (11.1%) Hispanic, 10 (1.0%) Native American, 780 (77.7%) White, 32 (3.2%) Multiracial, and 6 (0.6%) Other.

2.1. Measures

2.1.1. Rationalizations for eating meat

The 4Ns has four four-item scales with 7-point Likert-type items whose correlations ranged from 0.62 to 0.75. Cronbach's alpha coefficients were: 0.81 (natural), 0.91 (necessary), 0.54 (normal), and 0.87 (nice).

2.1.2. Personality traits

We used the IPIP-50 (Goldberg, 1992) to measure big five traits. The measure has 5 10-item scales with 5-point Likert-type items. Cronbach's alphas were 0.90 (stability), 0.90 (extraversion), 0.82 (openness) 0.85 (agreeableness), and 0.83 (conscientiousness).

2.1.3. Values

We measured values using the Rokeach Values scale (Rokeach, 1973). Each value was measured with a single 7-point Likert-type item.

2.1.4. Vegetarian motives

The Vegetarian Eating Motives Inventory (VEMI; Hopwood et al., under review) is a measure of health, environmental, and animal rights motives for a plant-based diet. The measure uses 7-point Likert-type items. The VEMI scales distinguished vegetarian from non-vegetarian participants in initial validation studies, and the health scale was reliably correlated with the personality trait agreeableness as well as an array of personal values. Traits and values were not reliably associated with the environmental or animal rights motives (see <https://osf.io/52v6z/>). Associations between the VEMI and 4Ns scales have not been examined previously. Cronbach's alphas for the VEMI were 0.91 (health), 0.94 (environment), and 0.96 (animal rights).

2.2. Analyses

We used bivariate correlations and regression models to examine correlations between the 4Ns and measures of traits, values, and plant-based eating motives. We used a Type I error rate of 0.01 except for our examination of correlates between 4Ns scales and values, for which we used the more conservative rate of 0.001 given the large number of values. Data are available at <https://osf.io/52v6z/> (sample 2).

3. Results

As an initial test of the validity of the 4Ns, we first compared individuals who reported being vegetarian or vegan (N = 41) with individuals who did not (N = 944) in terms of 4Ns scale scores. Table 1 shows that all four scales distinguished between these two groups, and that the effects were very large ($d > 1$). We also examined the scales with respect to demographic characteristics. None of the 4Ns scales were meaningfully related to income, social status, or age (correlations

Table 1
Mean 4Ns differences between meat-eaters and vegetarian/vegans.

	Meat-Eaters	Vegetarian/Vegan	t
Natural	4.89 (1.30)	2.54 (1.44)	11.31*
Necessary	4.09 (1.71)	1.75 (1.40)	8.64*
Normal	4.65 (0.99)	3.31 (1.25)	8.39*
Nice	4.98 (1.42)	1.94 (1.43)	13.45*

* $p < .01$.

Table 2
Associations between 4Ns scales and big five personality traits.

	Neuroticism		Extraversion		Openness		Agreeableness		Conscientiousness	
	r	β	r	β	r	β	r	β	r	β
Natural	0.07	−0.05	−0.07	−0.15	−0.09*	0.10	−0.10*	0.11	−0.02	0.16*
Necessary	.09*	0.06	0.06	0.25*	−0.13*	−0.10	−0.11*	−0.02	−0.06	−0.05
Normal	0.12*	0.17*	−0.09	−0.15*	−0.12*	−0.06	−0.17*	−0.21*	−0.08*	−0.14*
Nice	0.04	−0.07	−0.03	0.02	−0.13*	−0.10	−0.12*	−0.04	−0.05	−0.04
Multiple R		0.14*		0.19*		0.16*		0.18*		0.12

*p < .01. βs from regression model with all 4NS scales entered to predict one trait at a time.

ranged from 0 to 0.08). Men were more likely than women to rate eating meat as normal (d = 0.17) and nice (d = 0.20) (both p < .01).

We used both bivariate correlations and regression models to examine associations between the 4Ns scales and big five traits (Table 2). The advantage of the regression models is that the specific associations of traits with rationalizations can be interpreted in light of the shared associations among the 4Ns scales. The advantage of the correlations is that they do not suffer from suppression effects, which is particularly important given the sizeable correlations among 4Ns scales. Thus, we only interpreted effects that were statistically significant and in the same direction both as a correlation and a standardized regression coefficient. By this criterion, high neuroticism, low agreeableness, and low conscientiousness were related to rationalizing meat consumption as normal, and traits were unrelated to the other three rationalizations.

Table 3 shows bivariate correlations between 4Ns scales and both

Table 3
Correlations between 4Ns scales and values.

	Natural	Necessary	Normal	Nice
<i>Instrumental Values</i>				
Truth	0.04	0.03	0.01	0.05
Responsible	0.05	0.06	0.03	0.07
Hardworking	0.09	0.09	0.09	0.08
Forgiving	0.04	0.09	0.02	0.06
Open-Minded	−0.14*	−0.12*	−0.14*	−0.12*
Courageous	0.03	0.10	0.03	0.05
Helpful	−0.01	0.01	0.00	0.00
Loving	0.06	0.08	0.04	0.07
Capable	0.07	0.05	0.06	0.06
Clean	0.02	0.08	0.04	0.00
Self-Controlled	0.07	0.05	0.08	0.08
Independent	0.05	0.06	0.08	0.07
Happy	0.07	0.08	0.05	0.08
Polite	0.02	0.05	0.04	0.08
Intellectual	−0.01	−0.01	0.00	0.00
Obedient	0.15*	0.24*	0.18*	0.16*
Logical	0.07	0.03	0.04	0.08
Creative	−0.06	0.03	−0.04	−0.09
<i>Terminal Values</i>				
Peace	−0.08	0.01	−0.07	−0.05
Family Security	0.10	0.10	0.06	0.11
Freedom	0.08	0.03	0.06	0.07
Equality	−0.15*	−0.15*	−0.16*	−0.15*
Self-Respect	0.06	0.02	0.10	0.05
Happiness	0.06	0.05	0.03	0.07
Wisdom	0.02	0.01	−0.01	−0.01
National Security	0.17*	0.24*	0.16*	0.18*
Salvation	0.15*	0.24*	0.17*	0.18*
Friendship	0.08	0.06	0.04	0.08
Accomplishment	0.08	0.08	0.06	0.05
Harmony	0.00	0.01	0.00	−0.02
Comfort	0.12*	0.08	0.11	0.16*
Love	0.11	0.11	0.11	0.08
Beauty	−0.03	0.03	−0.04	−0.06
Pleasure	0.14*	0.11	0.10	0.16*
Recognition	0.07	0.19*	0.10	0.10
Excitement	0.03	0.15*	0.06	0.08

*p < .001.

Table 4
Multiple regression models of 4NS scales and values.

	Natural	Necessary	Normal	Nice	Multiple R
<i>Instrumental Values</i>					
Open-Minded	−0.06	−0.02	−0.08	−0.01	0.15*
Obedient	−0.11	0.25*	0.09	0.02	0.25*
<i>Terminal Values</i>					
Equality	−0.01	−0.05	−0.09	−0.06	0.18*
National Security	−0.06	0.24*	−0.01	0.08	0.25*
Salvation	−0.12	0.25*	0.05	0.08	0.25*
Comfort	0.04	−0.06	0.02	0.16*	0.17*
Pleasure	0.06	0.00	−0.04	0.14*	0.17*
Recognition	−0.19*	0.28*	0.04	0.04	0.22*
Excitement	−0.22*	0.25*	0.01	0.08	0.20*

*p < .01. βs from regression model with all 4NS scales entered to predict values one at a time.

instrumental and terminal values. Table 4 shows regression models for values that were correlated with at least one 4Ns scale in Table 3. The values of obedience, national security, and salvation were associated with the belief that eating meat is necessary. Valuing comfort and pleasure were associated with enjoying the taste of meat. Finally, beliefs that eating meat is natural and necessary were associated with valuing recognition and excitement.

Table 5 shows associations between 4Ns scales and vegetarian motives. Both environmental and animal rights motives for a plant-based diet were negatively related to seeing meat as natural and nice.

4. Discussion

Most people eat non-human animals even though it is empirically established that doing so has negative individual and social consequences. The dissonance between this behavior and its consequences is often resolved by justifications that allow people to sustain the behavior by rationalizing its consequences. Research suggests that people primarily use one of four rationalizations for this purpose: the belief that eating meat is natural, necessary, normal, or nice. Thus far, little is known about what kind of people rationalize meat eating in these different ways. The goal of this study was to begin to generate psychological profiles of individuals who tend to use these four different

Table 5
Associations between 4Ns scales and vegetarian motives.

	Health		Environment		Animal Rights	
	r	β	r	β	r	β
Natural	−0.08	−0.12	−0.38*	−0.27*	−0.32*	−0.28*
Necessary	−0.06	−0.02	−0.29*	−0.02	−0.22*	0.06
Normal	−0.03	0.07	−0.28*	0.07	−0.04	0.16*
Nice	−0.05	−0.01	−0.36*	−0.19*	−0.35*	−0.29*
Multiple R		0.09		0.40*		0.38*

*p < .01. βs from regression model with all 4NS scales entered to predict vegetarian motives one at a time.

rationalizations for eating meat.

4.1. Profiles of the 4Ns

Construing meat as natural allows individuals to see killing and eating animals as a way to connect to their environment. As an example, the National Rifle Association promotes hunting as a means for learning life lessons, including “being a fully-functioning part of the web of life” (<https://www.nrahf.org/articles/2017/12/31/how-hunting-imparts-life-lessons/>). In this study, this rationalization was associated with valuing recognition and excitement and being unsympathetic to the negative impacts of eating meat on the environment or the well-being of non-human animals. This profile suggests a brawny, earthy person who believes that part of communing with nature has to do with taking one’s place at the top of the food chain, which may be associated with an admirable and zestful existence.

Viewing meat-eating as necessary allows people to rationalize eating animals in terms of their personal self-interest the health and the well-being of their loved ones. The fishing industry avails this rationalization by promoting the health benefits of eating seafood for “reducing obesity, preventing chronic diseases...and improving infant health” (e.g., <http://thenaa.net/us-aquaculture-and-health>). As with the belief that eating meat is natural, the values of recognition and excitement were associated with the belief that it is necessary, as were the additional values of obedience, national security, and salvation. This pattern portrays a politically conservative individual who eats meat as a part of their more general faith in and respect for traditional norms. One might expect such a person to avoid questioning the practice of eating meat so long as it is a cultural standard and circumvent consideration of other options.

Seeing meat consumption as normal allows people to rationalize the behavior based on the fact that it would be unusual not to eat animals. The American advertising campaign “Beef, it’s what’s for dinner” appears to target people with this perspective. In this study, rationalizing meat-eating as normal was associated with high neuroticism, low agreeableness, and low conscientiousness. Personality psychologists have observed that these three personality traits cluster together into a higher order “stability” domain (DeYoung, 2006) that has been shown to have a variety of maladaptive correlates, including personality disorder (Samuel & Widiger, 2008) and other forms of psychopathology (Kotov, Gamez, Schmidt, & Watson, 2010). This set of findings mirrors previous research linking meat eating in general to personality constructs such as low empathy, social dominance, and authoritarianism (e.g., Dhont, Hodson, Costello, & MacInnis, 2014; Ruby & Heine, 2011), and may suggest that these links are conditioned upon the normalizing rationalization in particular. That is, people with relatively immature or otherwise “dark” personalities may be more prone to view meat eating as normal without questioning the behavior beyond that.

Some people simply like the taste of meat so much they could not imagine giving it up. For instance, in 2017 television commentator Charles Barkley said that he does not trust vegetarians like basketball player LaMarcus Aldridge because “Nobody doesn’t like meat!”. In the present study, valuing comfort and pleasure were associated with thinking meat is nice, as were lower levels of concern for the environment and animal rights. Individuals who believe eating meat is nice may tend to favor excess to temperance, and on that basis discount the consequences of their behavior.

4.2. Individual differences and meat-eating rationalizations

One general conclusion from these findings is that the closer individual difference variables in content, the stronger associations will be with meat-eating rationalizations. Whereas personality traits are relatively distal to reasons why people eat meat specifically, general values are a little more similar, and motivations not to eat meat are even more similar in content. Thus, it is not surprising that effect sizes

tended to increase somewhat across these three domains. This is an important consideration for future work that attempts to understand the psychological characteristics associated with eating behavior in general, and the 4Ns in particular.

The exception to this generalization was the normal scale, which was associated exclusively with personality and not at all with values, whereas all three other rationalizations were associated with values but not personality. This pattern may suggest that this motivation is qualitatively different from the other motives. The normal scale was also less internally consistent than the other scales. Examination of the items for this scale suggests that, while they all capture the perspective that meat-eating is “normal”, they are relatively heterogeneous in scope. This might explain its lower internal consistency, and perhaps its association with personality traits as opposed to specific values. It would be helpful for future work to explore the potential multidimensionality of this construct (see Piazza et al., 2015), and to examine potential correlates of different aspects of the normal rationalization.

4.3. Applied implications

In addition to adding to the basic science of preferences for meat, the results of the present study could be used for research aimed at enhancing dissonance and promoting healthier and more sustainable and ethical food choices. That is, identifying the meat-eater’s primary rationalizations may be a useful technique for advocates wishing to challenge those rationalizations in order to encourage plant-based eating. Of course, these results could also be used by the meat industry to enhance certain rationalizations, as some of the campaigns mentioned above illustrate. It would be useful for future research to determine the viability of using information about individual motives for meat or plant-based diets to affect behavior change (e.g., Weibel, Ohnmacht, Schaffner, & Kossmann, in press).

4.4. Limitations and future directions

Future studies should also address some of the limitations of the current work. One main limitation is that all of the data we collected were based on self-reports in a convenience sample. Multi-method individual differences data and behavioral data on actual consumption would be useful to validate and extend these findings. Moreover, the effects in this study were generally small, and all hypotheses were exploratory. Replication is needed to have greater confidence in these results.

Further exploration of the connections between rationalizing meat consumption and vegetarian motives is particularly indicated, given the relative novelty of research on each of these topics. Two particular findings were of note in this study. First, in contrast to the VEMI validation studies in which health motives had the most consistent associations with various criteria, the strongest correlations with the 4Ns were for the more “ethical” scales involving the environment and animal rights. These results seem to suggest that there is an ethical dimension underlying motives to eat or not eat meat that is only identifiable when both sets of questions are asked. Second, associations between these instruments were negative but far from 1. This suggests there may be people who are high or low in both types of motives. Alternatively, this could be an artifact of some type of response set. It might be informative for future work to compare people who are high in one and low in the other, to test whether these motives are essentially operating on the same underlying motives or whether there is truly independence between eating meat because you *are not* motivated by vegetarian arguments and eating meat because you *are* motivated by meat eating rationalizations.

More generally, it would be useful for future research to build upon these descriptive findings towards a more mechanistic understanding of how different psychological motives contribute to eating meat. One practical step is to assess the perceived importance of eating meat, the

absence of which was a limitation of the current work. It will also be critical to examine third variables, including theoretically plausible covariates, moderators, and mediators, that might explain or elaborate associations between individual difference constructs such as traits or values and meat-eating rationalizations. Ultimately, such work would contribute to an explanatory model linking general psychological individual differences, rationalizations for eating meat as well as other food choices, and eating behavior (e.g., Keller & Siegrist, 2015).

5. Conclusion

The primary rationalizations for eating meat despite the empirically-established negative consequences of this behavior include the beliefs that it is natural, necessary, normal, and nice. In this study, we examined the individual differences in personality, values, and vegetarian eating motives that were specifically associated with each of these rationalizations. We found that people who think eating meat is natural tend to value recognition and excitement and are unsympathetic regarding the benefits of plant-based diets for the environment or animal rights; people who think eating meat is necessary also value recognition and excitement as well as obedience, national security, and salvation; people who see meat-eating as normal tend to be neurotic, disagreeable, and low in conscientiousness; and people who eat meat because it tastes nice value comfort and pleasure. These initial results provide preliminary insights into the underlying personalities and values of people who use different rationalizations for meat eating and potentiate future food preference research and food-related advocacy.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.foodqual.2019.02.004>.

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