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Value attitude behaviour and social stigma in the adoption of veganism: An integrated model

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ABSTRACT

While veganism has been growing and receiving increasing attention, there is a gap on how factors such as health and environmental beliefs and anti-speciesism values, that create attitude towards their diets, influence their vegan behaviour. Furthermore, the role of social stigma experienced by vegans has not been examined within this context. Building on the value-attitude-behaviour model, the present study addresses this gap by conceptualizing these different streams of variables to build a testable conceptual framework for understanding how these factors contribute to maintaining a vegan lifestyle. The study uses structural equation modelling to analyse the data on 315 vegan consumers, testing the framework and its variables. The study shows that the value-attitude-behaviour model can successfully be applied to vegan behaviour. The findings show that anti-speciesism values are strong predictors of a positive attitude toward a vegan diet. Furthermore, social stigma does not inhibit consumers from maintaining a vegan lifestyle. Ultimately, the study contributes to a novel multifaceted model for understanding veganism in broader terms, allowing for the examination of other influencing factors on a complex outcome. The findings are useful for policymakers and marketing practitioners to engage in understanding behavioural segments.

1. Introduction

Veganism has grown in popularity in recent years and is forecasted to keep rising. In 2016, market research found that Britain's vegan population had tripled from 2006 to 2016, going from 150,000 to 542,000 (Finnerty & Townend, 2020). Google trends show a seven-fold increase in the search term 'veganism' between 2014 and 2019 (The Vegan Society, 2020). Recently, Veganuary, a UK organisation encouraging consumers to go vegan for the month of January, saw a record-breaking 560,000 people sign up for their 2021 campaign (The Vegan Society, 2021). In the United States, sales of plant-based foods grew 11% in 2019, bringing the total plant-based market value to $5 billion (Good Food Institute, 2020). Globally, the market value for plant-based products is forecasted to be $14.3 billion in 2025, compared to an estimated $8.9 billion in 2019 (Statista, 2021). A vegan diet is stricter than a vegetarian diet, which involves not consuming meat, poultry, fish, seafood, or products containing these foods (Cramer et al., 2017; Hoffman, Stallings, Bessinger, & Brooks, 2013). An example of a multinational company joining the vegan movement through expanding its scope of plant-based alternatives is McDonalds. They recently rolled out its McPlant burger in Denmark and Sweden, co-developed with Beyond Meat Inc. (Patton, 2021). The latter also formed a joint venture with PepsiCo to establish The PLANeT Partnership to develop, produce and market innovative food products made from plant-based protein (PepsiCo, 2021).

Academic research finds that the main reasons for adopting a vegan diet are mainly related to animal wellbeing, the environment, and health (e.g., Braunsberger & Flamm, 2019; Cramer et al., 2017; Janssen, Busch, Rödiger, & Hamm, 2016; Kerschke-Risch, 2015). Those adopting veganism attempt to end the exploitation of animals, reverse the environmental destruction because of that exploitation and prevent the associated personal and societal costs to human health. Up until the early 2010 s newspapers' portrayal of vegans in the UK consisted of a derogatory and ridiculing attitude where vegans were essentially stigmatised (Cole & Morgan, 2011). Cole and Morgan (2011) work considers two contributory factors, both concerning the speciesist order, suggesting the cultural ridicule of veganism, and Cohen's theory of denial of speciesism. Since then, there has been a change noted with high-profile celebrities such as Beyonce and Benedict Cumberbatch playing an integral role in the popularisation of veganism in mainstream

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society (see Lundahl, 2020; Jallinoja, Vinnari, & Niva, 2019). In various studies, vegans have been shown to assess life satisfaction higher (Janáček & Šťastný, 2018; Krizanova & Guardiola, 2020) and report less stress and anxiety than omnivores (Agarwal et al., 2015; Beezhold, Radnitz, Rinne, & DiMatteo, 2015). Nonetheless, recent research still show that vegans are being viewed from a negative perspective (MacInnis & Hodson, 2017) and that meat-eaters view anticipated stigma as a barrier to going vegan (Markowski & Roxburgh, 2019). In addition, vegans themselves also indicate that they experience some form of stigmatism concerning their vegan lifestyle (e.g., Buttny & Kinefuchi, 2020; Rosenfeld, 2018). This might explain why, despite its increasing popularity, vegans still only make up a small number of the total population. Recent data shows that in Western countries such as the United States, The Netherlands, and United Kingdom only about 1–3% of the population identify as vegan (Reinhart, 2018; Statista 2018, 2020). So, while there is fragmented research on people's beliefs and values to go vegan (such as health or anti-speciesism), attitudes of vegans towards a vegan diet and experienced stigmatisation; prior studies in this field fail to include these factors together to view how they influence the adopted vegan diet. In addition, there appears to be limited research on how people maintain meat-reduced diets, including dietary adherence (e.g., Rosenfeld, 2018). This suggests there is a pressing need to understand what the antecedents are that would explicitly promote a value-driven vegan lifestyle that consumers are likely to adopt.

The theory underpinning the current study is Homer and Kahle (1988) value-attitude-behaviour theory (VAB). VAB implies a hierarchy of cognition in which the influence flows from values (abstract cognitions) to attitudes, and ultimately to specific behaviours (i.e., value → attitude → behaviour). Homer and Kahle (1988) tested the model in the context of natural food shopping and proposed that value dimensions influence attitudes toward natural food, and in turn influence natural food shoppers' shopping behaviour. Their analysis showed that values had no direct relationship with behaviour but mediated values and behaviour. They found that values have 'distinct dimensions' (p. 645) that are useful for attitude and tendency to behave. Attitudes, in general, have been expressed as a tricomponent model consisting of cognitive, affective, and conative (Fishbein, 1967). Fishbein and Ajzen (1975) referred to attitudes as "a learned predisposition to respond in a consistently favourable or unfavourable manner with respect to a given object" (p. 10). Attitudes are associated with specific objects and are a type of cognitive evaluation (Gnoth, 1997; Perugini & Bagozzi, 2001). The model suggests that the influence theoretically moves from nonrepresentational cognitions to stronger cognitions to specific behaviour (Milfont, Duckitt, & Wagner, 2010). Based on the suggestion of Homer and Kahle (1988) that these causal influences can be tested with other products, many scholars within different domains (e.g., environment) have done so.

In terms of food consumption and environmental and ethical issues, the VAB model has been widely applied in a variety of study contexts. For example, environmental and ethical motives have been found to have a strong influence on attitudes towards organic food, suggesting that the more positive the attitude towards organic food the higher the intention to consume, or pay for, organic food (e.g., Honkanen, Verplanken, & Olsen, 2006; Shin, Moon, Jung, & Severt, 2017). In addition, Kang, Jun, and Arendt (2015) find that health values influence attitude and intention to purchase healthy foods. This hierarchical impact was also found in buyer behaviour such as organic (Grunert & Juhl, 1995) and food shopping behaviour (Goldsmith, Frieden, & Henderson, 1997). Thus, against this backdrop, the VAB model is an appropriate theoretical foundation for this study, since it investigates the interrelationships between different types of vegans' values and beliefs (e.g., health and environmental), the effect of these values and beliefs on vegans' attitudes towards their diet, and the effect of these variables on vegan behaviour, while also providing the opportunity to extend the model by exploring the effect of social stigma experiences. Particularly as veganism is experiencing the shift to becoming more mainstream and socially acceptable, we find ourselves at a crossroads where investigating the interplay between these factors could accelerate our understanding and actual adoption rates of the lifestyle. Hence, using the value-attitude-behaviour model (Homer & Kahle, 1988), the present study conceptualises these streams of variables to build a testable conceptual framework for understanding how these factors contribute to adopting and experiencing a vegan lifestyle.

2. Hypotheses development and conceptual framework

Before discussing the conceptual framework further, it is important to elaborate on the term veganism. Academic literature discussing veganism, and its definition, tends to focus on a diet (e.g., Braunsberger & Flamm, 2019; Crimarco et al., 2020; Ploll & Stern, 2020), including vegan food choices (Costa, Gill, Morda, & Ali, 2019; Marangon, Tempesta, Troiano, & Vecchiato, 2016; Messina & Mangels, 2001; Radnitz, Beezhold, & DiMatteo, 2015). However, veganism can also extend to personal care and beauty products, household products, living, and fashion (Castoria, 2014). Cherry (2015) mentions veganism to be a lifestyle movement, involving people's everyday lifestyle choices. In practice, there is no single definition of veganism. Being vegan relies mostly on self-identification and not everyone who identifies as vegan necessarily complies with the same vegan principles (Braunsberger & Flamm, 2019; Cherry, 2006). Hence, this study considers someone vegan if they self-identify as a vegan. Besides purchasing vegan food, this can also include not purchasing other animal-derived and cruelty-free products, which extend to personal care products, furniture, and clothing (Bayramoğlu, 2019). The following sections discuss research around consumers' most common values and beliefs to adopt a vegan lifestyle, the potential mediating effect of social stigma as discussed in vegan literature, and how these variables relate and contribute to behaviour, resulting in a conceptual framework.

2.1. Values, beliefs and attitudes

Consumers that follow a vegan lifestyle usually hold certain values and beliefs for doing so. Values motivate the actions of individuals and groups and serve as standards by which individuals and groups judge themselves and others (Schwartz, 1994). For vegans, anti-speciesism values are often important. Speciesism is when we value humans more than animals or believe that humans deserve a categorically higher moral status than other beings (Caviola & Capraro, 2020). In other words, speciesism is the belief that humans are inherently more valuable than other species (Caviola, Everett, & Faber, 2019) and refers to the denial of rights and freedom for animals (Ryder, 2006). Others argue that an equal moral footing for animals, similar to humans, is based on the discourse around sentience, cognition, and consciousness (Butcher, 2014). Conversely, many have argued animals' intellectual lives and emotional sensitivity in their support for the exploitation of animals and health-related issues (Griffin, 1981; Khazaal & Almiron, 2016; Masson & McCarthy, 1995). Those with anti-speciesism values are concerned for animal wellbeing, animal rights, and animal suffering, and are often referred to as ethical vegans (e.g., Braunsberger & Flamm, 2019; Radnitz et al., 2015). Ethical vegans have also been shown to score lower on speciesism than other types of vegans (Braunsberger & Flamm, 2019). They often experienced a significant moment in life that made them turn to veganism. They have acquired knowledge about animal cruelty through a documentary, for example, resulting in a catalytic experience that then motivates a lifestyle change (Cherry, 2015; McDonald, 2000).

Besides anti-speciesism values, following a vegan lifestyle can also be motivated by a desire to be more healthy or for environmental reasons (see Braunsberger & Flamm, 2019; Janssen et al., 2016; Rosenfeld & Burrow, 2018; Ruby, 2012). Research on those following a vegan diet because of health beliefs almost solely focuses on diet. Health vegans believe that a vegan diet could prevent illness and increase personal wellbeing (Janssen et al., 2016; Rothgerber, 2013) or is a way to weight-

loss (Costa et al., 2019). Environmental values include concerns about climate change, ecological balance, and resource scarcity (e.g., Hoffman et al., 2013; Kerschke-Risch, 2015; Rothgerber, 2013). Notably, these values and beliefs are not that clear-cut. Vegans might identify with different values and beliefs to varying degrees but reflect more strongly with some over the others (Janssen et al., 2016; Kerschke-Risch, 2015). There are also other reasons for people to adopt a vegan diet, such as religion, taste, or social reasons. However, a literature review undertaken by Janssen et al. (2016) which specifically looked at studies on consumer motives for following a vegan diet, followed up by an empirical study of their own, found that health, ethical (incl. anti-speciesism values), and environmental beliefs are by far the most common and therefore used in this study.

Earlier research has found that beliefs for adopting lifestyle influences the extent of and compliance with the lifestyle, relating values to behaviour. For example, those identifying as vegan based on health beliefs are found to be more likely to adopt a vegan diet rather than a fully vegan lifestyle (Braunsberger & Flamm, 2019; Cherry, 2006). These consumers often follow a less strict diet (Hoffman et al., 2013; Radnitz et al., 2015) and struggle more to maintain a vegan diet than ethical and environmental vegans (Greenebaum, 2012). In addition, vegan consumers with higher health beliefs might eat clean meats produced through cell replication, whereas ethical vegans would not, since these meats are still derived from animal products (Braunsberger & Flamm, 2019). These attitudes are often overlooked when linking values to behaviour. Attitudes are considered an important indicator of behaviour, in this case experiencing and maintaining a vegan lifestyle. As discussed in the preceding paragraph, one of the main features of the VAB model is the emphasis on the role of attitudes on the values and behaviours relationship, and so the current study provides much-needed insight into the relationship between vegan values and beliefs and attitudes through the following hypotheses:

H1: Environmental beliefs have a positive direct effect on attitudes.
H2: Anti-speciesism values have a positive direct effect on attitudes.
H3: Health beliefs have a positive direct effect on attitudes.

2.2. Social stigma

Even though current research has shown that the image of veganism has changed in recent years from a stigmatized lifestyle to a more normalized lifestyle (Lundahl, 2020), how much this realistically impacted the uptake of a vegan diet is still to be further investigated. Markowski and Roxburgh (2019) for example pointed out that fear of stigmatization is likely to be a barrier to avoiding meat consumption. Their analysis showed that non-vegans anticipate stigma associated with the eating behaviours of vegans. Other research has looked at inhibitors to adopt a vegan lifestyle, such as the taste of meat, lack of information about plant-based diets, limited availability of vegan food, and social barriers (e.g., Cheah, Sadat Shimul, Liang, & Phau, 2020; Crimarco et al., 2020; Lea, Crawford, & Worsley, 2006; Markowski & Roxburgh, 2019). As mentioned earlier in this article, those having adopted a vegan lifestyle still feel stigmatised for their lifestyle (e.g., Buttny & Kinefuchi, 2020; Rosenfeld, 2018). Vegans have raised difficulties such as being ridiculed or picked at for being vegan (Johnson, 2015; MacInnis & Hodson, 2017), lack of support from family and friends (McDonald, 2000), not having other vegans in their social network (Cherry, 2015) or not being able to participate in meals because there is no appropriate food (Cherry, 2015; Johnson, 2015). The authors of this paper conducted exploratory interviews in 2020 and found similar social stigma experiences and examples among Australian vegans. Although there is research about experienced social stigma, it is not clear what the effect (and the extent) of social stigma is on vegan behaviour, and whether positive attitudes towards a vegan diet have any influence on the experienced social stigma. Similarly, we also assume that social stigma can have a mediating role between attitude and behavioural intention, extending our conceptual framework.

In line with the value-attitude-behaviour model, the study also investigates the effect of attitude on behaviour, expecting attitudes to have a positive effect on vegan behaviour. This leads to the following hypotheses:

H4: The stronger the attitude towards a vegan diet, the weaker vegans' affinity will be towards social stigma.
H5: The stronger the affinity towards social stigma, the weaker will be the influence on vegans' behavioural intention.
H6: Attitude towards a vegan diet has a positive direct effect on vegans' behavioural intention.
H7: Social stigma mediates the relationship between attitude and behavioural intention.

2.3. Conceptual framework

Fig. 1 is the conceptual framework proposed based on the above discussion capturing key constructs, linkages, and processes involved in the relationship between vegan values and beliefs, vegans' attitude towards their diet, the mediating role of social stigma that vegans experience, and ultimately behavioural intention.

3. Materials and methods

This study is funded and is part of a larger study approved by the university's Ethics Committee complying with the National Statement on Ethical Conduct in Human Research (Australian Research Council (2018), 2018). The participants are Australian residents and were recruited from an anonymous panel by an international market research firm. Questions were filtered at the onset and the study only included individuals that self-identified as 'vegan' to better position this research. As already mentioned earlier, there are different ways of defining and practicing a vegan lifestyle, some being stricter than others (Braunsberger & Flamm, 2019; Cherry, 2006) and hence this study considers someone vegan if they self-identified as a vegan and consume a vegan diet.

3.1. Measures

The measures were adopted from various sources. (Anti-)speciesism is measured by Dhont, Hodson, Costello, and MacInnis (2014) scale, based on scales by Herzog, Betchart, and Pittman (1991) and Wuensch, Jenkins, and Poteat (2002). Participants are also given the following definition of speciesism: "speciesism is the human-held belief that all other animal species are inferior" (PETA 2020) to assist them in answering the question. Health and environmental beliefs for adopting a vegan lifestyle are measured by scales from Bayramoğlu (2019). For the attitude component, respondents indicate their level of agreement on six semantic differential scales (harmful/beneficial; pleasant/unpleasant; good/bad; worthless/valuable; enjoyable/unenjoyable; impossible/possible) taken from Sainsbury and Mullan (2011) and adapted to the focus of this study. Other scales to test the hypothesized structural model are also taken from the literature and where necessary adapted to match this study. Social stigma experienced by those that have adopted a vegan lifestyle is taken from Johnson (2015). This scale is chosen over the anticipated stigma scale by Rosenfeld and Tomiyama (2020) because the latter focuses on non-vegans' view of social stigma around veganism, while our study measured vegans' experiences on the importance of stigma. Respondents were given the following information before answering to the items on social stigma: "The following statements describe the difficulty or difficulties you might have experienced as a consequence of your vegan lifestyle". Vegan behavioural intention is measured by a question by Bayramoğlu (2019) and asks participants about purchases concerning diet, personal care products, clothing, and furniture. All questions are measured using a 5-point Likert-type scale

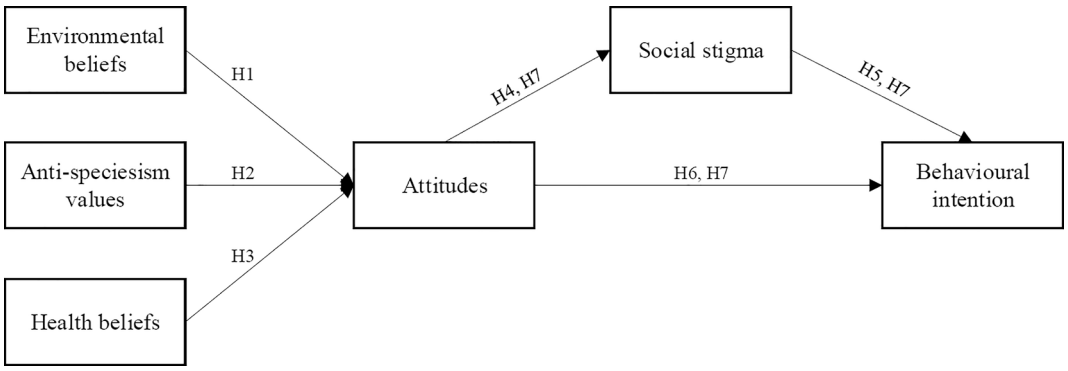


Fig. 1. The conceptual framework.

ranging from 1 (not at all important) to 5 (highly important), except for the attitude scale where respondents are asked to answer from 1 (strongly disagree) to 5 (strongly agree). The final section of the survey collects socio-demographic information (e.g., education, living situation, occupation, and income).

3.2. Data

A pilot study was conducted with 30 respondents to pre-test the instruments (Baker, 1994). This was done to verify that the questions and their sequencing were clear (De Vaus, 1993). Ultimately, a total of 315 respondents took part in the survey, and no respondents were deleted after screening the data. This study uses structural equation modelling (SEM) to test the hypotheses. Although some argue that a sample size of 100–200 is adequate for SEM, especially if the number of items is less than 40 (DeVellis, 2003; Anderson & Gerbing, 1984; Hair et al., 2014), others suggest that the sample size should be at least 300 (Worthington & Whittaker, 2006; Tabachnick & Fidell, 2013). Another approach is to look at the ratio of subjects to items rather than the sample size. Some mention a 5:1 ratio as being adequate, although a 10:1 ratio is preferred (Bentler & Chou, 1987; Hair, Black, Babin, Anderson, & Tatham, 2010; Nunnally, 1978; Tabachnick & Fidell, 2013). Kline (2015) recommends a minimum of 10:1, preferring 20:1. With 32 parameters and 315 respondents, the ratio for this study is 9.8:1, and based on the above discussion can be considered appropriate for conducting SEM. Besides, according to Bentler and Bonett (1980), the chi-square value can be sensitive to large sample sizes, simultaneously lacking the power to distinguish between a good fit and poor fit model with other smaller sizes (Kenny & McCoach, 2003). Table 1 gives a detailed overview of the sample regarding gender, age, living situation, and education.

Looking at the socio-demographic profile, the sample represents the population in line with previous studies involving vegetarians and vegans, showing that vegans are more likely to be female and under 45 years of age (Johnson, 2021; Pfeiler & Egloff, 2018; Bits, 2020). Furthermore, associations between higher education and reduced meat consumption are visible in the sample (Paslakis et al., 2020; Pfeiler & Egloff, 2018), with vegans more often having a non-school qualification compared to the Australian population – 74% compared to 63% (see Australian Bureau of Statistics, 2020).

Table 1
Socio-demographic profile.

AGE	Frequency	Percent
18 – 24	58	18.4
25 – 34	97	30.8
35 – 44	103	32.7
45 – 54	38	12.1
55 – 64	13	4.1
65 – 74	5	1.6
Prefer not to say	1	0.3
GENDER		
Female	175	55.6
Male	137	43.5
Other	2	0.6
EDUCATION		
Primary school	1	0.3
Some secondary school	16	5.1
Completed secondary school (Year 12)	64	20.3
Trade qualification or apprenticeship	38	12.1
Certificate or Diploma (TAFE or business college)	92	29.2
Tertiary	104	33
LIVING SITUATION		
Live alone	48	15.2
Live with spouse/partner	82	26
Live with spouse/partner & child/children	118	37.5
Live with child/children	22	7
Live with relative(s)	28	8.9
Live with unrelated adult(s)	17	5.4
OCCUPATION		
Employed full time	190	60.3
Employed part time	79	25.1
Unemployed looking for work	20	6.3
Unemployed not looking for work	6	1.9
Retired	5	1.6
Student	11	3.5
Disabled	4	1.3

4. Results

4.1. Measurement model

The study uses IBM SPSS AMOS 27 to analyse the data. Following Anderson and Gerbing (1988), a two-step approach was undertaken to test the measurement model, after which a structural model was tested. The measurement model shows the test of the confirmatory factor analysis (CFA) using the Maximum-likelihood (ML) estimation procedure where a series of relationships propose how the observed variables represent the latent variables. It demonstrates whether the proposed model is suitable to signify the relationships of the conceptual relationships. The measurement model was evaluated by verifying whether the indicator loadings were statistically significant to confirm the validity and reliability tests. The latent constructs were tested to ascertain if they surpassed the desired values of 0.60 (Swanson & Horridge, 2004). A couple of factor loadings were 0.40 and below and discarded (Shevlin & Miles, 1998). Other measures were adopted to assess the extent to which the measurement model fits the observed data (Hair, Anderson, Tatham, & Black, 1998; Kline, 1998). The fit indices were equally good for which were moderately within the range: $\chi 2 = 603.334$, degrees of freedom [df] = 422; p = .000; x2 /df = 1.430, CFI = 0.97; IFI = 0.97; TLI = 0.96, GFI = 0.897, AGFI = 0.87, NFI = 0.91 and RMSEA = 0.037. The Chi-square statistic p = .000 has two problems: (a) "its values are not interpretable in a standardized way'' and (b) "it is

very sensitive to sample size.'' (Kline, 1998, p. 128), hence we have retained this model (see Table 2).

The model was then tested and evaluated for reliability, convergent validity, and discriminant validity (see Table 3). Composite reliability (CR) was used to measure the reliability of a construct. The recommended standard for CR should be >0.70 (Hair et al., 2010). All the values of the CR were well above 0.70, thus suggesting a high internal consistency of the scales and good reliability. For convergent validity, the average variance extracted (AVE) needs to be greater than 0.50 (Fornell & Larcker, 1981). All factors had an AVE value greater than 0.50. The study applied the method by Fornell and Larcker (1981) to establish discriminant validity by demonstrating that a construct is distinct from other constructs (Hair et al., 2010). The results reveal that the square root of AVE is larger than the correlation coefficient indicating that all the variables have a positive discriminant validity (Fornell & Larcker, 1981). Table 3 shows that the corresponding correlations between the variables are significant ($p < .05$) and in the expected positive directions.

Table 2
Factor Loading, Mean and Standard Deviation.

Items	Factor Loading	M	S.D.
Anti-speciesism values AVE 0.54 CR 0.90			
I try not to contribute to the profit of companies and brands that cause animal suffering because it is not right.	0.673	4.12	1.04
I think that consuming or using animal products are wrong because animals are not our commodities.	0.768	4.1	1.068
I get upset when I see wild animals in cages at zoos.	0.687	4.03	1.103
It is wrong to kill animals for their fur to make clothes (fur coats).	0.713	4.32	1.005
The use of animals in rodeos and circuses is cruel.	0.771	4.03	1.103
It is wrong to kill animals for their fur to make clothes (fur coats).	0.778	4.32	1.005
I have seriously considered becoming vegan in an effort to save animal lives.	0.743	4.11	1.016
It is not acceptable for any cattle to be raised for human consumption.	0.766	4.11	1.087
Health beliefs AVE 0.53 CR 0.82			
I do not need meat and other animal products to be healthy.	0.774	4.27	1.01
Following a plant-based diet and avoiding animal products are better for my health.	0.844	4.32	0.861
I thought that if I would give up animal products, I would be much healthier.	0.690	4.15	0.992
I have adopted a vegan lifestyle because of health reasons.	0.611	4.03	1.118
Environmental beliefs AVE 0.69 CR 0.87			
I have adopted a vegan lifestyle because of environmental reasons.	0.776	4.03	1.118
Giving up meat and animal products is reducing my carbon footprint on this planet and serves to protect our environment.	0.893	4.13	1.051
A vegan lifestyle will help us immensely to reduce water, air and earth pollution and therefore protect and save the environment for our future generations.	0.834	4.17	1.031
Attitude towards vegan diet AVE 0.52 CR 0.84			
For me to maintain a strict vegan diet is Impossible: Possible	0.623	4.45	0.814
For me to maintain a strict vegan diet is Unenjoyable:Enjoyable	0.615	4.32	0.896
For me to maintain a strict vegan diet is find it Bad: Good	0.702	4.36	0.841
For me to maintain a strict vegan diet is Harmful:Be	0.776	4.35	1.037
For me to maintain a strict vegan diet is Unpleasant: Pleasant	0.878	4.23	0.939
Social stigma AVE 0.69 CR 0.94 N = 315			
I have experienced an inability to participate in meals because there is no appropriate food	0.768	3.39	1.433
I have been called nasty names	0.862	2.77	1.464
I have been labelled as having issues	0.854	2.94	1.496
I have often faced harassment	0.884	2.9	1.512
I have been picked at being a vegan	0.808	3.24	1.396
I have been ridiculed or laughed at	0.828	3.15	1.477
I have been mocked at or made fun of very often	0.838	3.14	1.458
Vegan behavioural intention AVE 0.55 CR 0.86			
I buy food that is vegan.	0.605	4.54	0.77
I choose to buy products from brands that avoid animal testing.	0.809	4.3	0.979
I always buy products that are cruelty-free.	0.775	4.33	0.855
When I need to buy clothing, I do not choose to buy any items that are made from animal skin, fur or any other products causing harm to animals.	0.791	4.24	0.964
When I need to buy furniture, I do not choose to buy any items that are made from animals.	0.707	4.23	1.004

The study also tested multicollinearity for tolerance values which shows that it is greater than the appropriate recommended level of 0.20 (tolerance levels ranged from 0.50 to 0.90). Similarly, the VIF values were also less than the recommended level of 5.00 (VIF ranged from 1.00 to 1.90) showing that there is no influence of multicollinearity (Fox, 1991).

The common method variance (CMV) was employed to alleviate CMV bias as the study used a self-reported survey. Harman's one-factor test was used to show eigenvalues since the first factor accounted for 31.2% variance which is well in the recommended range of less than 50% (see Harman, 1976). However, we used the common method bias-adjusted composites.

We further examined the model fit statistics for the structural equation. Goodness-of-fit indices quantify the degree of correspondence between a hypothesised latent variable model and the data (Kenny & McCoach, 2003). The Goodness of fit indices shows that the model is a good fit. The $\chi^2 = 7.628$ with degrees of freedom [*df*] = 4; $p = .106$. The normed chi-square should be a value between 1 and 3 to indicate a well-fitting model (Carmines & McIver, 1981), and in this case is $\chi^2/df = 1.907$. For RMSEA, values less than 0.06 demonstrate a good fit (Byrne, 2016; MacKenzie, Podsakoff, & Podsakoff, 2011). In our study RMSEA = 0.054. GFI and AGFI range from zero to 1 with values closer to 1 indicating a better fit, and values above 0.95 indicating the best fit (Schumacker & Lomax, 2004). Our model's GFI = 0.99 and AGFI = 0.95. For both the CFI and NFI, fit is considered adequate if the values are larger than 0.90 and preferably larger than 0.95 (Byrne, 2016). This model's CFI = 0.99 and NFI = 0.99. Lastly, the IFI = 0.99 and TLI = 0.99. The IFI was developed to deal with issues of parsimony and sample size related to NFI. Both TLI and IFI range from zero to 1 and values of 0.95 indicate a good fit (Byrne, 2016). Hence, the model in Fig. 1 can thus be deemed as an acceptable estimate of the relationships evident in the data.

In Table 4, the regression coefficients of the empirical model reveal that hypothesis 1, *Environmental beliefs have a positive direct effect on attitudes*, is significant but has a negative direct effect on attitudes ($\beta = -0.111$, $p < .05$). Hypothesis 2, *Anti-speciesism values have a positive direct effect on attitudes*, was significant and supported ($\beta = 0.364$, $p < .001$). Similarly, hypothesis 3, *Health beliefs have a positive direct effect on attitudes*, was also significant and well supported ($\beta = 0.280$, $p < .001$), although having a slightly lower beta value than anti-speciesism values. Hypothesis 4, *The stronger the attitude towards a vegan diet, the weaker vegans' affinity will be towards social stigma*, was significant ($\beta = 0.542$, $p < .001$), and so was hypothesis 6, *Attitude towards a vegan diet has a positive direct effect on vegans' behavioural intention* ($\beta = 1.113$, $p < .001$). Hypothesis 5, *The stronger the affinity towards social stigma, the weaker will be the influence on vegans' behavioural intention* ($\beta = 0.561$, $p < .001$), was supported but had a positive effect on behavioural intention ($\beta = 0.49$, $p < .001$). The mediating effect for hypothesis 7, *Social stigma mediates the relationship between attitude and behavioural intention*, was computed using the mediation bootstrapping analysis of 95% bias-corrected bootstrap confidence intervals with 5000 bootstrap samples. The indirect effect was positive as expected and significant ($\beta_{ind.} = 0.28$, 95% Bootstrap CI [0.11, 0.61], $p = .001$).

Table 3
Discriminant validity.

	Social stigma	Anti-speci values	Attitude	Behavioural intention	Health beliefs	Env beliefs
Social stigma	**0.83**					
Anti-speci values	0.253	**0.73**				
Attitude	−0.114	0.433	**0.72**			
Behavioural intention	0.092	0.615	0.398	**0.74**		
Health beliefs	0.247	0.623	0.394	0.560	**0.73**	
Env beliefs	0.272	0.692	0.296	0.428	0.641	**0.83**

Table 4
Measurement Model.

			Std Estimates	S.E.	C.R.
Anti-speciesism values	−−>	Attitude	0.364	0.033	7.699***
Environmental beliefs	−−>	Attitude	−0.111	0.022	−2.93**
Health beliefs	−−>	Attitude	0.280	0.027	6.776***
Attitude	−−>	Social stigma	0.542	0.3	4.091***
Social stigma	−−>	Behavioural intention	0.561	0.04	5.763***
Attitudes	−−>	Behavioural intention	1.113	0.095	10.765***

****P Values* at the 0.001 level; ** *P Values* at the 0.05 level.

5. Discussion

This article argues that veganism should be investigated more broadly to understand the underlying drivers and antecedents of adopting a vegan lifestyle, including but not limited to their effects on vegan behaviour. The sheer tenacity of coming to grips with this idea of becoming vegan has given rise to many questions of how consumers are motivated towards veganism and the critical impacts it can have on their end goals such as maintaining the lifestyle.

Although we assumed that there was a positive association with attitudes, our research shows one negative relationship. Both anti-speciesism values and health beliefs have a positive effect on attitude, while environmental beliefs have a declining effect on attitudes. This indicates that the stronger the environmental beliefs for being vegan, the weaker the attitude impact on the vegan diet. It is likely that environmental beliefs in the case of adopting a vegan diet play a role in protecting the environment and may not necessarily impact attitudes positively because attitudes to maintain a strict vegan diet are more focused on the individual self. Those with anti-speciesism values generally have a strong moral imperative not to harm animals, and not eating any animal derived products is imperative to anti-speciesism (also looking at the large contribution of animals to the human diet) and thus likely contributing to a positive attitude towards their vegan diet. Those following a vegan diet for health beliefs have been found to see a change in terms of weight-loss and personal wellbeing (e.g., Costa et al., 2019; Crimarco et al., 2020) which as a result also likely leads to a positive attitude toward the diet.

Even though not all values and beliefs are significant predictors of favourable attitudes toward a vegan diet, the results of this study do show that attitudes have a positive effect on behaviour, providing evidence that the value-attitude-behaviour hierarchy model can be applied to vegan behaviour, positively influencing behaviour. The stronger the affinity towards social stigma, the weaker is the influence on behavioural intention. In this research, consumers didn't appear to place importance on social stigma that would influence behaviour. This is different from literature looking at non-vegans adopting a vegan lifestyle finding that vegan stigma is a barrier that inhibits dietary shifts (Lea et al., 2006; Markowski & Roxburgh, 2019). This is an interesting finding as this previous research indicates that non-vegans are of the perception that vegans severely disrupt social conventions associated with food and that vegans are susceptible to stigma. Yet our research shows social stigmatization not at all important in influencing a vegan diet. So, it does not inhibit consumers from maintaining a vegan lifestyle. In terms of practical relevance, future research should explore the behavioural segments of vegan versus non-vegan differently as their aspirations parallel their experiences differently.

This study shows that the conceptual framework combining the factors is critical to understanding how consumers respond to maintaining vegan lifestyles. Firstly, anti-speciesism values and health beliefs appear to be intrinsically positively linked to attitudes, as also found in previous literary works. Secondly, our research shows that social stigmatization around following a vegan lifestyle, including a vegan diet which is profoundly a strong social activity (Delormier, Frohlich, & Potvin, 2009; Markowski & Roxburgh, 2019), does not affect behaviour severely. Our results support that veganism not only influences food choices but is a part of an emerging social movement that prioritizes animal welfare and animal rights (Pfeiler & Egloff, 2018) and encompasses a broader vegan lifestyle behaviour (Katcher, Ferdowsian, Hoover, Cohen, & Barnard, 2010; Napoli & Ouschan, 2020), not significantly affected by social stigma.

5.1. Implications

The findings of this study are critical since food preference for veganism is becoming more prominent and could become more accepted, even in the sports, health, and fitness industry (Rogerson, 2017). Similarly, there is also a need for a new role for institutions and policies related to public health, animal wellbeing, and the use of resources in motivating a greater uptake of plant-based food choices (Bogueva, Marinova, & Gordon, 2020). They can be used to improve the efficacy of public health projects centred on promoting plant-based diet adoption and reducing meat consumption.

Understanding beliefs and consumer perspectives of speciesism of what it means to adopt a vegan lifestyle should not be seen in isolation. Retailers should also recognize that while many consumers turn to veganism for health reasons, it's hard to give up comfort food (Budgar, 2017), and thus marketers should be able to find proper substitutes that satisfy the need of this segment. Understanding the vegan food repertoires of vegan customers will provide the first step. In addition, marketers can play a role in showing that veganism does not have to be an "all-or-nothing" lifestyle as often is considered by omnivores (Leenaert, 2016). Consumers could be encouraged to trial a vegan diet (such as U. K.'s Veganuary) or incorporate elements of a vegan diet in their lifestyle (such as a vegan day a week). Particularly when the motivation is health or animal wellbeing related, one is likely to develop a positive attitude towards the diet, which in turn is more likely to lead to dietary adherence.

Social stigma may not be a major impediment as it was once predicted. Mainly because today's consumers perceive that adopting a vegan diet can be seen as an essential change towards a more sustainable food approach (Gonera et al., 2021; Maler, 2021). The increase in providing vegetarian and vegan recipes has also contributed to switching towards vegan diets (Asano & Biermann, 2019), given that consumers are more aware of their health benefits and acceptability in society.

5.2. Future research and limitations

There are limitations to note regarding interpreting and generalizing the findings reported in this study. All consumers had to be practicing vegans, but by including non-vegans one would be able to identify the likely differences or no differences in the response of those who are vegans. There could also be other beliefs such as religion or culture that can dominate a vegan diet. Also, the figures can be generalized only to the vegan market and not the vegetarian markets. Even though these are closely similar, they are very different. The cross-sectional design of the study limits causal attributions, nor does it provide an in-depth understanding of the motivations of vegan practices. This contrasts with longitudinal designs where the data could be collected at several points in time. Similarly, a qualitative determination would provide a better sequential explanation of the findings of this study.

Having said that, even if these limitations may reduce the generalizability of the findings, they do not affect the value of illustrating that certain values and beliefs fundamentally affect attitudes, and in turn vegan lifestyles. There are some implications as far as anti-speciesism and social vegan stigma are concerned for all types of consumers. A qualitative analysis would be appropriate to gain a richer understanding of consumer's decision making and factors that influence their end goals.

Lastly, the VAB model is a widely cited analytical model and provides a clear overview of how values, attitudes and behaviour are interrelated. Nevertheless, the VAB model is linear in nature; the elements in the model follow a clear flow representing an idealistic process. However, because of its linear nature it showed to be an appropriate model for investigating external influences on the VAB process by incorporating factors such as social stigma. Another limitation is that, even though one would theoretically argue that values have a causal impact on consequent behaviours, scholars argue that explicit and total conceptualised values can become a yard stick of judgement, preferences, and choices (Williams, 1979). Since the model relates to specific behaviours, several other antecedents may be required to be incorporated. For instance, factors such as the perceived behavioural control can be incorporated or extended within the model as it deals with the ease or difficulty in adopting a behaviour or underpinning motivational variables that drive behaviour.

6. Conclusions

This study contributed to the literature by conceptualizing a framework based on distinct behaviours and outcomes. This is the first empirical study in veganism to incorporate together environmental, health and anti-speciesism beliefs, and a mediator such as social stigma in a specific integrative framework to analyse their relationships and effects on attitude and vegan behaviour. By conceptualizing these complex relationships, the research opens new theoretical insights to scholars interested in studying veganism.

CRediT authorship contribution statement

Anne Renée Brouwer: Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing. **Clare D'Souza:** Methodology, Formal analysis, Writing – original draft, Writing – review & editing. **Stephen Singaraju:** Funding acquisition, Conceptualization, Supervision. **Luis Alfredo Arango-Soler:** Writing – review & editing.

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