

**Your Hamburger With a Side of Oppression: Cognitive Dissonance and Social Justice Values**

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### **Abstract**

There are two important reasons to eat plant-based: the production of animal products negatively impacts the climate, and it harms animals. When it comes to how the second reason might motivate behavioral change, current psychological research exclusively focuses on animal welfare beliefs (i.e. beliefs about how animals are treated in the agricultural industry). However, some animal ethicists argue that we should avoid consuming animal products, because doing so constitutes a form of discrimination against animals similar to other forms of discrimination (e.g. sexism, racism, etc.). They thereby ground the moral reason to eat plant-based in social justice values. This correlational study shows that both animal welfare beliefs and social justice beliefs separately predict animal product-related cognitive dissonance, which can motivate people to eat more plant-based. The study further shows that, when accounting for the predictive power of animal welfare beliefs, social justice beliefs remain a statistically significant predictor of animal product-related cognitive dissonance. It also shows that social justice beliefs are twice as strong of a predictor of animal product-related cognitive dissonance, and explain more than twice the variance in animal product-related cognitive dissonance than animal welfare beliefs. The correlational nature of this research does not allow us to draw causal conclusions about the association between social justice beliefs and animal product-related cognitive dissonance. However, this study should inform future experimental research. For in disregarding social justice beliefs, the current research overlooks a potentially powerful way to affect a dietary shift toward a plant-based diet.

*Keywords:* cognitive dissonance, social justice values, animal welfare values, hierarchical regression

## Introduction

Our consumption of animal products is problematic for at least two reasons. One, it significantly contributes to climate change: animal agriculture is responsible for 14.5% of global human-induced greenhouse gas (GHG) emissions (Gerber, et al., 2013; Henedus, et al., 2014). And two, it harms nonhuman animals on a grand scale: globally, roughly 220 million nonhuman land animals are slaughtered every day (Roser, 2023; Singer, 1975). Thus, reducing our consumption of animal products promises to decrease our GHG emissions and reduce animal suffering (Poore & Nemeck, 2018).

Despite these reasons to eat plant-based, and the fact that most people care about animal welfare and are willing to change their behavior to reduce GHG emissions, most people consume animal products (Bell, et al. 2021; European Commission, 2016; Jones, 2023; Riffkin, 2015). This does, however, suggest that cognitive dissonance could motivate people to eat plant-based. The classic interpretation states that cognitive dissonance is the product of incongruence between one's beliefs and acts (e.g. believing animal welfare is important while consuming factory farmed animal products) (Festinger, 1957). And people strive to resolve or avoid this dissonance, either through dissonance avoiding/reducing strategies like willful ignorance, or behavior change (Rothgerber, 2020). Inducing cognitive dissonance thus has the potential to reform behavior (Brouwer, et al., 2022).

Out of the two reasons for why our consumption of animal products is problematic, the moral reasons are more likely to induce animal product-related cognitive dissonance (APCD)<sup>1</sup>. There are at least two reasons for this: First, the harm in either case is different in kind. The harm we inflict on the climate can generally be offset (Broome, 2012). You can compensate for the climate harm of eating a hamburger by using public transport instead of your own car. On the contrary, you cannot offset harm done to nonhuman animals, hereafter "animals" for ease of exposition, because we inflict them on a

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<sup>1</sup> Other research talks about "meat-related cognitive dissonance" (e.g. Rothgerber, 2020), but both the environmental and the moral reasons to eat plant-based also pertain to the consumption of animal products more broadly. We therefore use the term animal product-related cognitive dissonance.

unique individual. You cannot compensate for the slaughter of an individual cow, by feeding the ducks in the park. Our ability to offset climate harms allows us to engage in cognitive dissonance avoiding/reducing strategies that are not available to us when coming to terms with the harm we inflict on animals (e.g. we can note that we act climate consciously in areas other than diet). Second, incongruence between moral beliefs and an act generally seem to produce the strongest feelings of cognitive dissonance (May & Kumar, 2023; Silva Souza & O'Dwyer, 2022). Thus, emphasizing the moral reasons to eat plant-based rather than the environmental ones seems most promising for inducing APCD.<sup>2</sup>

The current literature on APCD already displays this emphasis with its predominant focus on the harmful treatment of animals by the agricultural industry (i.e. animal welfare) (Bouwman, et al., 2022; Dowsett, et al., 2018; Semmler, et al., 2023; Tian, et al., 2016; Weingarten & Lagerkvist, 2023). Research also shows that most people think animal welfare is important, that they continue to eat meat, and that this leads them to experience cognitive dissonance (Kunst & Hohle, 2016; Loughnan & Davies, 2020; Ruby & Heine, 2012). This is explained by the incongruence between the beliefs that (a) it is morally wrong to unnecessarily harm animals and (b) the production of animal products unnecessarily harms animals, and the act of consuming animal products. Call this the *animal welfare view*. Research further reveals that this cognitive dissonance leads to stronger intentions to eat food that does not contain animal products, which, in one study, resulted in a doubling of the vegetarian meals sold (Bouwman, et al., 2022). This leads us to our first hypothesis:

H1. Endorsing the animal welfare view positively correlates with animal product-related cognitive dissonance.

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<sup>2</sup> Strictly speaking this is a false dichotomy, because our desire to mitigate climate change is ultimately also driven by moral considerations. For why do we want to mitigate climate change if not to reduce harm and suffering? However, the climate change issue is less overtly moral.

Although this harm reductionist animal welfare view is most prominent in the philosophical debate on animal ethics, it only tells part of the moral story. A singular focus on the consequences of the exploitative systems we have designed (i.e. the suffering we inflict on animals), disregards the inherent immorality of these exploitative systems. It disregards the fact that social justice values (e.g. anti-dominance and anti-oppression values) also ground an ethical case for a plant-based diet (Adams, 1990; Bentham, 1789; Crary & Gruen, 2022; Singer, 1989; Spiegel, 1996; Taylor, 2017). The idea is that, similar to how men use sexist beliefs and practices to oppress women, and white people use racist beliefs and practices to oppress people of color, we humans use speciesist beliefs and practices (e.g. rearing, breeding, and consuming animals) to oppress members of other species. These dominance relations are argued to be objectionable, regardless of both whom the oppressor and the oppressed are, and the consequences of the oppression (Crary & Gruen, 2022). This approach casts the animal liberation movement as part of a broader emancipatory movement, which includes feminism, BLM, Queer Pride, etc. The consumption of animal products is therefore taken to violate the social justice values underpinning this emancipatory movement. Call this the *social justice view*.

As mentioned, the animal welfare view predicts APCD, but there are at least two reasons to investigate whether the same holds for the social justice view: first, we should not overstate the effect of the animal welfare view-induced APCD on behavior change. Although one study did find a doubling of the vegetarian meals sold when activating the animal welfare view, this was a doubling from 4.7% to 9.9% (Bouwman, et al., 2022). Secondly, the social justice view might induce APCD in a different way than the animal welfare view. Its resulting APCD might therefore be distinct from the APCD induced by the animal welfare view.

To elaborate on this second point, there is a philosophical and a psychological reason for why the social justice view might induce cognitive dissonance distinct from the animal welfare view. First, the

philosophical reason: the moral values activated by these two views are distinct. This difference can be illustrated by imagining a scenario where the production of animal products inflicts no harm. For instance, we can imagine that we genetically manipulate cows to painlessly die of natural causes at their prime age for consumption, and we give these cows their best possible life before they pass. The farmer only has to retrieve the bodies from the field, not unlike harvesting vegetables (McMahan, 2008). Under such circumstances, however farfetched they might seem, one can still morally object to the consumption of animal products even though the animals are not harmed, on grounds that it expresses a dominance relationship.

In addition to this philosophical reason for why the animal welfare view and the social justice view might induce APCD differently, there is a psychological reason to believe this: social justice values seem more central to self-identity than animal welfare values. There are arguably more self-identified feminists, BLM supporters, LGBTQIA+ allies, than people who self-identify as animal welfarists (i.e. people who take their animal welfare beliefs to be central to their self-identity). This is somewhat speculative, because compared to categories like feminist, BLM supporter, and LGBTQIA+ ally, etc., the category animal welfarist is uncommon and therefore has not received the same attention from researchers. However, research does show that compared to self-identified vegans, about whom we might most safely assume they self-identify as animal welfarists, there are, for instance, far more self-identified feminists (Barroso, 2020; Jones, 2023).<sup>3</sup>

The centrality of values to self-identity is important for how cognitive dissonance might be induced. As mentioned, traditionally cognitive dissonance is understood as incongruence between a belief or set of beliefs and an act. But it can also be understood as incongruence between one's self-identity and an act or belief (e.g. a devout Christian who experiences cognitive dissonance after coveting his neighbor's wife) (Aronson, 1968; Steele, 1988). Provided the reasoning in the previous paragraph is

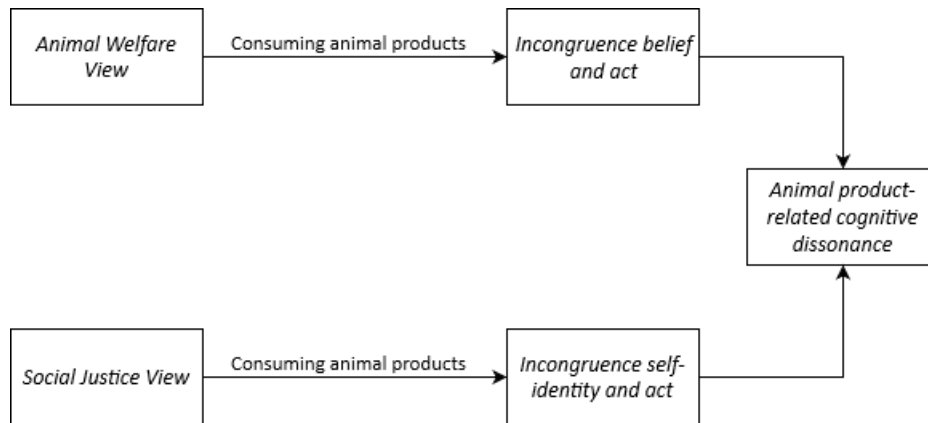
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<sup>3</sup> This is a charitable assumption, because people are vegan for reasons other than animal welfare (e.g. climate change, and health).

sound, the social justice view seems more likely to induce APCD because of incongruence between one's self-identity and an act than the animal welfare view is. Thus, the different views might induce cognitive dissonance in a distinct way (see Figure 1).

**Figure 1**

*Two Pathways of APCD*



The above suggests two things: First, the social justice view is predictive of APCD. This leads us to our second hypothesis:

H2. Endorsing the social justice view positively correlates with animal product-related cognitive dissonance.

And second, it suggests that the social justice view predicts APCD even when accounting for the predictive power of the animal welfare view. This leads us to our third and final hypothesis:

H3. The social justice view uniquely predicts animal product-related cognitive dissonance not explained by the animal welfare view.

Confirmation of our second and especially our third hypothesis would suggest the social justice view might be an additional tool to motivate people to eat plant-based, which is important given the benefits of such a dietary shift: a significant reduction in both GHG emissions and animal suffering.

## **Method**

### **Participants**

The study included 161 participants; 115 women (71.4%), 35 men (21.7%), 2 identified as a non-binary gender (1.2%), and 9 participants elected not to volunteer data on their gender (5.6%). The average age of participants was 33.20 years ( $SD = 14.97$ , ranging from 18 years old to 93 years old). Among the participants were 58 omnivores (36%), 44 flexitarians (27.3%), 8 pescetarians (5%), 29 vegetarians (18%), and 22 vegans (13.7%).

### **Design and Data Analysis**

This was a correlational study concerned with the correlation between the continuous independent variables a) animal welfare beliefs and b) social justice beliefs, and the dependent variable c) APCD.

We used correlational analysis to determine whether the animal welfare view and social justice view each predicted APCD. We used hierarchical regression to determine whether the social justice view was a statistically significant predictor of APCD when accounting for the predictive power of the animal welfare view.

### **Procedure**

The study used a convenience sample. Researchers sent out the survey to acquaintances, and told them they could pass it on to their acquaintances (i.e. a snowball technique). Data was collected between the 29th of November 2023 and the 4th of December 2023. Participation in the study was voluntary and without external reward. The study was approved by the Ethics Committee of the Faculty of Behavioural and Social Sciences of the University of Groningen.



Upon opening the questionnaire, participants were presented with general information about the questionnaire, including: why one receives this information, the voluntary nature of participation, an overview of the study, and a statement on how the data will be handled. The questionnaire then asked the participant's consent to participate in the research. Participants then filled out several scales relating to the consumption of animal products, including scales on their: current diet, animal welfare beliefs, social justice beliefs, animal product-related cognitive dissonance, and biospheric values. The questionnaire ended by asking people their age and gender, and provided participants an opportunity to leave a comment.

### **Materials**

Animal welfare beliefs were measured with the subsection of the Animal Welfare Attitude scale pertaining to farm animals (Mazas, et al., 2013). The scale contains 6 items on both attitudes on and behavior toward farm animals and their products, which participants rated on a 5-point Likert scale ranging from *strongly disagree* to *strongly agree*. The Cronbach's  $\alpha$  of this scale was unsatisfactory (i.e. below 0.7). After analysis, we removed two items, and used a 4 item scale (Cronbach's  $\alpha$  = .669), which included items like, "Farm animals do not suffer" ( $M = 4.683$ ,  $SD = 0.494$ ).

Social justice beliefs about seeing our treatment of animals as a form of discrimination similar to sexism, racism, etc. were measured with the following item: "In addition to these concerns about how animals are treated, some people believe that humans have a prejudice in favor of our species and against animals. People who agree with this, think that favoring humans above animals is a form of discrimination similar to sexism (favoring men above women), racism (favoring white people above people of color), etc. How much do you agree with this idea?" Participants rated this item on a 7-point Likert scale ranging from *strongly disagree* to *strongly agree* ( $M = 3.8$ ,  $SD = 2.027$ ).

Animal product-related cognitive dissonance was measured with a three item scale (Cronbach's  $\alpha$  = .971). This scale, based on (Bouwman, et al., 2022), asks participants to rate to what extent they

would anticipate feeling “uncomfortable”, “uneasy”, and “bothered” with their next purchase of an animal product on a 5-point Likert scale ranging from *none at all* to *a great deal* ( $M = 2.290$ ,  $SD = 1.301$ ).

We used the items from the Environmental Portrayed Value Questionnaire related to biospheric values to measure biospheric values (e.g. protecting the environment) (Bouman, et al., 2018). This four item scale (Cronbach’s  $\alpha = .889$ ) asks participants to rate how important biospheric values are to them on a 5-point Likert scale, ranging from *not at all important* to *extremely important* ( $M = 4.176$ ,  $SD = 0.746$ ).

## Results

The assumptions for correlational analysis and hierarchical regression were met. Residual plots indicated a linear relationship between the independent variables and the dependent variable. The normal P-P plot indicated an approximately normal distribution of the residuals. The residuals plot indicated no strong deviations from homoscedasticity. The Durbin-Watson test indicated independence of observations. The VIF scores indicated no significant multicollinearity between the independent variables. And casewise analysis revealed no significant outliers.

As expected based on the existing literature, our first hypothesis was confirmed ( $r(159) = .319$ ,  $p < .001$ ). This means that the strength of one’s animal welfare beliefs is moderately predictive of the cognitive dissonance one expects to experience when buying animal products.

Our second hypothesis was also confirmed ( $r(159) = .494$ ,  $p < .001$ ). This means that the strength of one’s social justice beliefs about the link between discrimination toward animals and other forms of discrimination (e.g. sexism, racism, etc.) is strongly predictive of the cognitive dissonance one expects to experience when buying animal products.

Our third hypothesis was also confirmed. This hypothesis was tested with a hierarchical regression. The first step of the regression consisted of the variables age and gender to reduce noise. The variable gender was dummy-coded, because it included more than two categories. The genders

male, female, and non-binary were statistically significant and positively correlated with APCD. Step two added the animal welfare view as a variable, which was a statistically significant predictor of APCD, and explained a statistically significant part of the variance in APCD ( $\beta = 0.30$ ,  $R^2$  change = .077,  $p < .001$ ). None of the gender variables were statistically significant at the second step. Step three added the social justice view as a variable, which was a statistically significant predictor of APCD, and explained a statistically significant part of the variance in APCD ( $\beta = 0.42$ ,  $R^2$  change = .167,  $p < .001$ ), thereby confirming our third hypothesis. The predictive power of the animal welfare view reduced ( $\beta = 0.21$ ,  $p = .006$ ), and genders male and female were statistically significant at the third step. The complete model explained about 32% of the variance in APCD ( $R^2 = .318$ ) (see Table 1).

**Table 1***Hierarchical Regression on APCD*

Variable	B	95% CI for B		SE B	$\beta$	$R^2$	$\Delta R^2$
		LL	UL				
Step 1						0.074	0.074**
Constant	1.64***	1.01	2.28	0.32			
Gender: no data	0.86	-0.65	2.37	0.76	.93		
Gender: male	0.73**	0.24	1.22	0.25	.25**		
Gender: non-binary	2.66*	0.11	5.21	1.92	.17*		
Age	0.00	-0.01	0.02	0.01	.02		
Step 2						0.151	0.077*
Constant	-1.78	-3.76	0.19	1.00			
Gender: no data	1.20	-0.27	2.66	0.74	.13		
Gender: male	0.49	-0.01	0.98	0.25	.16		
Gender: non-binary	2.24	-0.22	4.70	1.24	.14		
Age	0.00	-0.01	0.02	0.01	.03		
Animal welfare view	0.77***	0.35	1.18	0.21	.30***		
Step 3						0.318	0.167***
Constant	-1.83*	-3.61	-0.06	0.90			
Gender: no data	1.04	-0.27	2.36	0.67	.11		
Gender: male	-0.45*	0.01	0.89	0.22	.15		
Gender: non-binary	1.72	-0.50	3.94	1.12	.11		
Age	0.00	-0.01	0.02	0.01	.06		
Animal welfare view	0.54**	0.16	0.93	0.19	.21**		
Social justice view	0.27***	0.18	0.36	0.05	.42***		

Note. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

### Exploratory Analysis: Non-Vegans

Given this study's aim of uncovering what might motivate people to eat plant-based, the target population does not necessarily include those who already eat plant-based, i.e. vegans. We therefore ran the same analysis on a sample excluding vegan participants.

In the non-vegan sample, at step one the genders male, female, and non-binary were statistically significant. Step two added the animal welfare view, which was a statistically significant predictor of APCD, and explained a statistically significant part of the variance in APCD ( $\beta = 0.21$ ,  $R^2$  change = .039,  $p = .020$ ). The variable non-binary remained the only statistically significant gender variable. Step three added the social justice view, which was a statistically significant predictor of APCD, and which explained a statistically significant part of the variance in APCD ( $\beta = 0.34$ ,  $R^2$  change = .111,  $p < .001$ ). In the complete model, animal welfare beliefs were no longer a statistically significant predictor of APCD. The gender variable non-binary remained statistically significant. The complete model of the non-vegan sample explained about 25% of the variance in APCD ( $R^2 = .253$ ) (see Table 2).

**Table 2**

*Hierarchical Regression on APCD: Non-Vegan Sample*

Variable	B	95% CI for B		SE B	$\beta$	$R^2$	$\Delta R^2$
		LL	UL				
Step 1						0.104	0.104**
Constant	2.17***	1.78	2.56	0.20			
Gender: no data	0.59	-0.46	1.65	0.53	.10		
Gender: male	-0.37*	-0.73	-0.01	0.18	-.17*		
Gender: non-binary	2.29*	0.48	4.10	0.92	.21*		
Age	-0.01	-0.02	0.01	0.01	-.10		
Step 2						0.142	0.039*
Constant	0.38	-1.18	1.93	0.79			
Gender: no data	0.86	-0.20	1.92	0.54	.14		
Gender: male	-0.26	-0.63	0.11	0.19	-.12		
Gender: non-binary	2.20*	0.42	3.98	0.90	.21*		
Age	-0.01	-0.02	0.01	0.01	-.09		
Animal welfare view	0.37*	0.06	0.69	0.16	.21*		

Step 3						0.253	0.111***
Constant	0.17	-1.29	1.63	0.74			
Gender: no data	0.77	-0.22	1.77	0.50	.12		
Gender: male	-0.26	-0.60	0.09	0.18	-.12		
Gender: non-binary	1.82*	0.15	3.50	0.85	.17*		
Age	-0.01	-0.01	0.01	0.01	-.06		
Animal welfare view	0.28	-0.02	0.58	0.15	.15		
Social justice view	0.17***	0.09	0.25	0.04	.34***		

Note. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

### Exploratory Analysis: Biospheric Values

Although this study focuses on the moral reasons for eating plant-based, we did measure biospheric values, which allows us to control for environmental beliefs. This is interesting given the aim of the study, for in motivating people to eat plant-based one might want to use the full range of reasons to do so, including environmental ones. Adding biospheric values to the regression model gives us the following results.

For the complete sample, in the first step the gender variables male, female, and non-binary were statistically significant. Step two added biospheric values, which were a statistically significant predictor of APCD, and explained a statistically significant part of the variance in APCD ( $\beta = 0.38$ ,  $R^2$  change = .136,  $p < .001$ ). The gender variables male and non-binary were no longer statistically significant. Step three added the animal welfare view to the model, which as a statistically significant predictor of APCD and explained a statistically significant part of the variance in APCD ( $\beta = 0.18$ ,  $R^2$  change = .026,  $p = .028$ ). The predictive power of biospheric values reduced when adding the animal welfare view to the model ( $\beta = 0.32$ ,  $p < .001$ ). The gender variable male became statistically significant again, and was negatively correlated with APCD. Step four added the social justice view to the model, which as a statistically significant predictor of APCD, and explained a statistically significant part of the variance in APCD ( $\beta = 0.37$ ,  $R^2$  change = .124,  $p < .001$ ). After adding the social justice view to the model, the animal welfare view was no longer a statistically significant predictor of APCD, and the predictive

power of biospheric values reduced ( $\beta = 0.23, p = .003$ ). The complete model with biospheric values explained about 33% of the variance in APCD in the complete sample ( $R^2 = .328$ ) (see Table 3).

For the non-vegan sample, in the first step the gender variables male, female, and non-binary were statistically significant. Step two added biospheric values, which were a statistically significant predictor of APCD, and explained a statistically significant part of the variance in APCD ( $\beta = 0.29, R^2 \text{ change} = .079, p = .001$ ). Step three added the animal welfare view to the model, which was not a statistically significant predictor of APCD. The gender variables male and female were no longer statistically significant. Step four added the social justice view to the model, which was a statistically significant predictor of APCD, and explained a statistically significant part of the variance in APCD ( $\beta = 0.31, R^2 \text{ change} = .086, p < .001$ ). The animal welfare view remained statistically non-significant as a predictor of APCD when we added the social justice view to the model, the predictive power of biospheric values was reduced ( $B = 0.19, p = .029$ ), and the gender variable non-binary was no longer statistically significant. The complete model with biospheric values explained about 28% of the variance in APCD in the non-vegan sample ( $R^2 = .282$ ) (see Table 4)

**Table 3**

*Hierarchical Regression on APCD Including Biospheric Values*

Variable	B	95% CI for B		SE B	$\beta$	$R^2$	$\Delta R^2$
		LL	UL				
Step 1						0.074	0.074*
Constant	1.64***	1.01	2.28	0.32			
Gender: no data	0.86	-0.65	2.37	0.76	.09		
Gender: female	0.73**	0.24	1.22	0.25	.25**		
Gender: non-binary	2.66*	0.11	5.21	1.29	.17*		
Age	0.01	-0.01	0.02	0.01	.02		
Step 2						0.210	0.136***
Constant	-0.84	-2.00	0.31	0.58			
Gender: no data	0.92	-0.48	2.32	0.71	.10		
Gender: female	0.75**	0.29	1.20	0.23	.25**		
Gender: non-binary	2.05	-0.33	4.42	1.20	.13		
Age	-0.01	-0.02	0.01	0.01	-.05		
Biospheric values	0.65***	0.39	0.90	0.13	.38***		

Step 3						0.236	0.026*
Constant	-2.58**	-4.50	-0.66	0.97			
Gender: no data	1.21	-0.27	2.51	0.70	.12		
Gender: female	0.59*	0.12	1.06	0.24	.20		
Gender: non-binary	1.89	-0.46	4.23	1.19	.12		
Age	-0.01	-0.02	0.01	0.01	-.04		
Biospheric values	0.54***	0.27	0.81	0.14	.32***		
Animal welfare view	0.48*	0.05	0.90	0.22	.18*		
Step 4						0.328	0.124***
Constant	-2.40**	-4.16	-0.63	0.89			
Gender: no data	1.01	-0.27	2.29	0.65	.11		
Gender: female	0.53*	0.10	0.96	0.22	.18*		
Gender: non-binary	1.52	-0.64	3.69	1.09	.10		
Age	0.01	-0.01	0.01	0.01	.01		
Biospheric values	0.39**	0.14	0.65	0.13	.23**		
Animal welfare view	0.36	-0.03	0.75	0.20	.14		
Social justice view	0.24***	0.15	0.33	0.05	.37***		

Note. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Table 4**

*Hierarchical Regression on APCD Including Biospheric Values: Non-Vegan Sample*

Variable	B	95% CI for B		SE B	$\beta$	$R^2$	$\Delta R^2$
		LL	UL				
Step 1						0.104	0.104**
Constant	2.17***	1.78	2.56	0.20			
Gender: no data	0.59	-0.46	1.65	0.53	.10		
Gender: male	-0.37*	-0.73	-0.01	0.18	-.17*		
Gender: non-binary	2.29*	0.48	4.10	0.92	.21*		
Age	-0.01	-0.02	0.01	0.01	-.10		
Step 2						0.183	0.079**
Constant	0.85*	0.01	1.69	0.43			
Gender: no data	0.58	-0.43	1.60	0.51	.09		
Gender: male	-0.41*	-0.76	-0.06	0.18	-.19*		
Gender: non-binary	1.93*	0.18	3.67	0.88	.18*		
Age	-0.01	-0.02	0.01	0.01	-.14		
Biospheric values	0.35**	0.15	0.55	0.10	.29**		
Step 3						0.196	0.013
Constant	-0.08	-1.62	1.47	0.78			
Gender: no data	0.75	-0.28	1.78	0.52	.12		
Gender: male	-0.33	-0.70	0.03	0.18	-.16		
Gender: non-binary	1.91*	0.17	3.66	0.88	.18*		
Age	-0.01	-0.02	0.01	0.01	-.13		
Biospheric values	0.30**	0.09	0.51	0.11	.25**		
Animal welfare view	0.23	-0.09	0.55	0.16	.13		

Step 4						0.282	0.086***
Constant	-0.15	-1.61	1.32	0.74			
Gender: no data	0.70	-0.29	1.68	0.50	.11		
Gender: male	-0.31	-0.66	0.03	0.17	-.15		
Gender: non-binary	1.65	-0.01	3.31	0.84	.15		
Age	-0.01	-0.02	0.01	0.01	-.10		
Biospheric values	0.23*	0.02	0.43	0.10	.19*		
Animal welfare view	0.18	-0.13	0.49	0.16	.10		
Social justice view	0.16***	0.07	0.24	0.04	.31***		

*Note.* \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

### Discussion

There are at least two reasons to reduce our consumption of animal products: (a) they significantly contribute to GHG emissions (Gerber, et al., 2013; Henedus, et al., 2014), and (b) their production inflicts considerable harm on animals (Roser, 2023; Singer, 1975). Given that most people claim to care about the environment and our treatment of animals yet still consume animal products, this study focuses on APCD as a way to motivate people to eat plant-based (Bell, et al. 2021; European Commission, 2016; Riffkin, 2015, Rothgerber, 2020). We hypothesized that both the endorsement of the animal welfare view (H1) and the social justice view (H2) would separately positively correlate with APCD, and that the social justice view would still do so even when accounting for the effect of the animal welfare view (H3). All three hypotheses were confirmed.

The confirmation of our hypotheses means that both animal welfare beliefs, as well as social justice beliefs about the link between discrimination towards animals (i.e. speciesism) and other forms of discrimination (e.g. sexism, racism, etc.) each separately predict APCD. It further means that these social justice beliefs predict APCD even when we account for the predictive power of animal welfare beliefs. But note that animal welfare beliefs and social justice beliefs are not equally predictive of APCD. Compared to animal welfare beliefs, social justice beliefs were twice as strong a predictor of APCD and explained more than twice the variance in APCD.



Given the current psychological literature's singular focus on the animal welfare view and complete lack of attention for the social justice view, these results are surprising. However, they are less surprising in light of the suggested difference in how the animal welfare view and the social justice view might induce cognitive dissonance. We argued that the social justice view, were it to induce cognitive dissonance, would likely do so through incongruence between self-identity and one's acts, while the animal welfare view would do so through incongruence between a specific belief and act (see figure 1). These different APCD pathways arguably allow for different levels of engagement in cognitive dissonance avoidance/reducing strategies. The incongruence with self-identity arguably allows for less avoidance/reducing strategies and therefore leads to stronger feelings of cognitive dissonance, for one is, perhaps in part per definition, less likely to barter with or abandon values important to one's self-identity (Aronson, 1968; Carpenter, 2019). This might explain why the social justice view is more predictive of APCD than the animal welfare view.

These results suggest that the psychological literature's focus on the animal welfare view instead of the social justice view might be misplaced, given that the latter is a stronger predictor of APCD. When our goal is to motivate people to eat a plant-based diet by inducing APCD, activating or convincing people of the social justice view might be more successful. However, we need to be cautious, because our correlational design does not allow us to draw causal conclusions. We discuss this further below, but first we discuss the results of our exploratory analysis.

Our exploratory analysis revealed that in the non-vegan sample both the animal welfare view and the social justice view were less predictive of APCD than in the complete sample. The complete model for the non-vegan sample also explained less variance in APCD than the complete model for the complete sample. But despite these results, our cautious conclusion that we should focus on the social justice view over the animal welfare view when trying to induce APCD holds even more firmly for the non-vegan sample. For although both the animal welfare view and the social justice view were less

predictive in the non-vegan sample than in the complete sample, the relative predictive and explanatory power (i.e. the amount of variance explained by a variable) of the social justice view was greater in the non-vegan sample than in the complete sample. That is, in the complete sample the social justice view was twice as predictive of APCD and explained twice the variance in APCD than the animal welfare view. But in the non-vegan sample the social justice view was more than twice as predictive and explained close to three times the variance in APCD than the animal welfare view. Thus, to induce APCD in non-vegans, it might be more effective to focus on social justice beliefs.

Our exploratory analysis of the predictive power of biospheric values further supports this conclusion. Although adding biospheric values to the regression model for both the complete and the non-vegan sample reduced both the predictive power and explanatory power of the social justice view, its predictive power was greater than that of the biospheric values. But, more importantly, adding biospheric values to the model resulted in the animal welfare view no longer being a statistically significant predictor of APCD in both samples. This suggests that the predictive and explanatory power of biospheric values strongly overlaps with that of the animal welfare view. This is also reflected by the fact that, in both samples, the variance explained by the complete model that included biospheric values was only marginally greater than the variance explained by the complete models that did not include biospheric values.

We can only speculate about the reason for why the predictive and explanatory power of biospheric values overlaps more strongly with that of the animal welfare view than the social justice view. Perhaps the novelty of the social justice view provides a buffer against the biospheric values. The environmental reasons and the animal welfare reasons seem far better known to the general populace. Those reasons might therefore have become more integrated and are seen as the reason to eat plant-based. The social justice view's predictive power might therefore be more distinct.

Both exploratory analyses strengthen the conclusion that we might achieve better results in motivating people to eat more plant-based if we focus on the social justice view. This especially holds when our motivational efforts include environmental reasons to eat more plant-based, because under those circumstances the social justice view is the only moral view that is statistically significant predictor of APCD. However, as mentioned, we should be cautious in the conclusions we draw, given our correlational design. We will discuss this now.

Our study has two important limitations: first, the correlational nature of our study. The ultimate goal is to understand what induces APCD, a causal relation, to provide tools to motivate people to eat plant-based. However, we cannot draw conclusions about this relation based on this correlational study. Although our study shows the social justice view positively correlates with APCD, it cannot establish whether the social justice view causes APCD, whether the reverse is true, or whether a third variable is responsible for the correlation we found.

However, this does not mean that we have to assume these causal relations are all equally likely. There are at least two reasons that count in favor of a causal flow from the social justice view to APCD than the reverse: first, the rationale for a causal flow from the social justice view to APCD is clear: endorsement of the social justice view entails incongruence between one's self-identity and the act of consuming of animal products, which causes APCD (Aronson, 1968; Steele, 1988). The rationale for the reverse causal flow is less clear. One might argue that stronger feelings of APCD cause a stronger belief in the social justice view as a way of rationalizing this dissonance. However, this rationale leaves us with the puzzle of why this rationalization especially heightens endorsement of the social justice view over the animal welfare view, even though the latter seems far more widely known. Second, other research establishes a causal relation between the animal welfare view and APCD (Bouwman, et al., 2022; Kunst & Hohle, 2016; Ruby & Heine, 2012). This means there is a causal flows from moral beliefs to

experiences of APCD. Although neither of these reasons conclusively establishes a causal flow from the social justice view to APCD, they do count in favor of such a causal relation over the reverse relation.

As for the possibility of a third variable that is responsible for the correlation between the social justice view and APCD, our exploratory analysis reveals that biospheric values do not play this role. Although the correlation between the animal welfare view and APCD disappeared once we introduced biospheric values to the model, it had no such effect on the social justice view. We can therefore eliminate at least one important potential confound.

The second limitation of our study pertains to the scale with which we measured participant's animal welfare beliefs and its Cronbach's  $\alpha$  of .669. This means that the items in our animal welfare scale shared less variance than what they did not share. The animal welfare scale might therefore not measure one construct, but multiple constructs. Since we are solely interested in the construct of animal welfare beliefs, this is a limitation of our study.

We used the scale from Mazas, et al. (2013), which did report a Cronbach's  $\alpha$  of at least 0.7. However, their study was done in Spain, while our participants were mostly Dutch or German residents. Cultural and societal differences between these populations might have affected the reliability of the scale. The 6 item scale, for instance, includes an item concerning the consumption of eggs from caged hens. However, selling such eggs was recently outlawed in the Netherlands and Germany (Besluit houders van dieren, 2021; TierSchNutzTV, 2021). This might explain why in our study Cronbach's  $\alpha$  did not reach 0.7.

Our recommendations for future research connect to the limitations of our study. First, if we want to motivate people to eat plant-based by inducing APCD, we need to uncover the causality of the relation between the animal welfare view and social justice view on the one hand, and APCD on the other. If we do not understand this relationship, we cannot be certain that activating either of these views increases APCD. Although, as mentioned, there has been experimental research into the effect of

the animal welfare view on APCD, and its effect on dietary change, no such research exists for the social justice view and APCD. Future research should address this gap, especially given this study's result that the social justice view is a stronger predictor of APCD than the animal welfare view.

Second, the scale for measuring animal welfare beliefs should be optimized so that Cronbach's  $\alpha$  is at least 0.7. This includes taking into account idiosyncratic cultural and societal beliefs about and behaviors toward animals.

### **Conclusion**

Animal welfare beliefs and social justice beliefs about the link between discrimination towards animals (i.e. speciesism) and other forms of discrimination (e.g. sexism, racism, etc.) both separately predict APCD. The social justice beliefs also predict APCD when accounting for the predictive power of animal welfare beliefs. Additionally, social justice beliefs were twice as strong of a predictor of APCD, and explained more than twice the variance in APCD than animal welfare beliefs. This is surprising given that, to our knowledge, none of the research into APCD looks at these social justice beliefs, and solely focuses on animal welfare beliefs for the moral side of the discussion. Additionally, contrary to social justice beliefs, animal welfare beliefs failed to be a statistically significant predictor of APCD when taking into account biospheric values, in both the complete sample and the sample excluding vegans. Because of the correlational nature of this study, we cannot draw any conclusions about the causality of this relation. This result should therefore inform experimental research into how the activation of social justice beliefs could motivate people to eat plant-based.

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