How does Right-Wing Authoritarianism Influence the Relationship Between Choice of Diet and Usage of Cognitive Dissonance Reduction Strategies?

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Abstract

Consuming animal products has widespread negative effects on the environment, health, and animal welfare. Many people experience negative arousal from engaging in this behaviour and use cognitive dissonance reduction strategies to decrease their aversive state, thereby resisting behavioural change. People's dietary choice and political orientation may impact the level of use of such strategies, yet their role has so far gained little attention. This study investigates how right-wing authoritarianism influences the relationship between choice of diet and usage of the cognitive dissonance reduction strategies of means-ends justifications, wilful ignorance, and denial of negative consequences. I hypothesise that dietary choice and right-wing authoritarianism are both related to the extent of using these cognitive dissonance reduction strategies and that an interaction effect exists. To test this, 161 participants were assessed on the above-mentioned variables in a cross-sectional online survey. The study yielded three main findings. Firstly, it found a gradient in use of justifications and denial from high to low for omnivores, pescatarians, vegetarians, and vegans, respectively. Secondly, there was a moderate positive association between right-wing authoritarianism and means-ends justifications as well as denial of negative consequences. Thirdly, right-wing authoritarianism and choice of diet interact in their influence, so that more authoritarian omnivores and pescatarians used more justifications as well as denial, and more authoritarian vegetarians used more justifications compared to their less authoritarian counterparts. There were no significant results concerning wilful ignorance. These findings highlight the interplay of right-wing authoritarianism and dietary choice concerning cognitive dissonance reduction strategy use which informs the development of intervention aiming to decrease animal product consumption.

Keywords: Choice of diet, right-wing authoritarianism, cognitive dissonance reduction strategies

How does Right-Wing Authoritarianism Influence the Relationship Between Choice of Diet and Usage of Cognitive Dissonance Reduction Strategies?

Every year more than 100 billion animals are farmed in the context of the food industry (Ritchie, 2023). This has severe, widespread negative consequences on the environment, health, and animal welfare. Animal agriculture is responsible for an estimated 14.5% of yearly greenhouse gas emissions, is the largest contributor to deforestation, and uses enormous amounts of the world's freshwater resources, while also playing a significant role in water pollution (Food and Agriculture Organization of the United Nations [FAO], 2023; Espinosa-Marrón et al., 2022; Sandler, 2022). Moreover, serious illnesses such as cancer, cardiovascular disease, Alzheimer's disease, and diabetes are linked to components abundantly found in animal products, for example, saturated fats, LDL cholesterol, heme iron, and lactose (Barnard & Leroy, 2020).

In addition, the treatment of animals in the food industry is abysmal. The vast majority of animals are held in highly restrictive, dirty confinements in large numbers, often being unable to move around or even lie down comfortably (Hampton et al., 2021; Ritchie, 2023). They are thus deprived of their natural behaviour, such as building nests, caring for their offspring, and being outside, and must endure mutilation processes, for example, mulesing in sheep and de-horning in cattle (Hampton et al., 2021). Most animals living in factory farms suffer from health issues due to parasitic infestations, injuries, and debilitating genetic manipulation to grow much larger and produce milk and eggs much faster (People for the Ethical Treatment of Animals, 2021). They are abused physically, reproductively, for example, through forced insemination, and emotionally, for instance, through separation from their offspring straight after giving birth (Hampton et al., 2021). Eventually, the animals are transported to slaughterhouses in order to be killed. Common slaughter and processing practices include throat-cutting, de-feathering or hair removal in hot-water tanks, skinning, and gassing, all while the animals are still conscious (Nielsen et al., 2020).

In the past decades, there has been an increase in awareness of the negative impact on environment, health, and animal welfare through increased media attention, undercover

documentation of maltreatment, and animal-rights activism (Ioannidou et al., 2023b; Tiplady et al., 2012). This has led to a growing global movement away from meat consumption towards more plant-based diets, that is, pescatarianism, vegetarianism, and veganism (Clem & Barthel, 2021; Croney & Swanson, 2023).

However, for much of the world population, this knowledge has not brought about a change in eating habits but rather a troubling moral conflict known as the "meat paradox" (Bastian, & Loughnan, 2016). This dilemma describes the incongruence between people's voiced concern about animal welfare while continuing to consume meat (Loughnan et al., 2014). When behaviour and moral values stand at odds, people engage in a psychological process explained by *cognitive dissonance theory* (Rothgerber, 2020). This theory postulates that inconsistencies between behaviour, moral values, and attitudes create negative arousal, known as the cognitive dissonance state. This aversive state can be decreased through a variety of reduction strategies, such as change of behaviour, values, or attitudes. In the context of meat consumption Rothgerber (2020) has specifically termed this concept *meat-related cognitive dissonance*. However, it is not a concept exclusively related to omnivores (who eat meat, fish, dairy, and eggs). Ioannidou et al. (2023b) found that it can also be expanded to individuals who have eliminated meat from their diet, that is pescatarians (whose diets include fish, dairy, and eggs) and vegetarians (whose diets include dairy and eggs). These dietary groups all experience cognitive dissonance related to their respective dietary preference, for example, fish-related cognitive dissonance for pescatarians. Another dietary group is comprised of vegans, who do not consume any animal products. They differ from other dietary groups in that their eating behaviour is most in line with their values and attitude, thereby eliciting no or low levels of negative arousal and cognitive dissonance (Ioannidou et al., 2023a).

To reduce aversive states of cognitive dissonance omnivores, pescatarians, and vegetarians engage in a variety of cognitive dissonance reduction strategies (CDRSs). According to previous research, these reduction strategies include *wilful ignorance* (WI), *means-ends justifications* (MEJ),

and *denial of negative consequences* (DNC) (Graça, Calheiros, & Oliveira, 2016; Ioannidou et al., 2023a; Rothgerber, 2020).

WI describes motivated disregard of information that could elicit cognitive dissonance (Rothgerber, 2020). In the context of animal farming WI can be seen in findings such as omnivores being less knowledgeable about common practices on factory farms compared to vegetarians (Hestermann et al., 2020). Additionally, Knight and Barnett (2008) discovered that some omnivores expressed the desire to remain unaware of such information as knowing could make meat consumption less enjoyable. WI thus seems to serve as a protective measure from potentially distressing information making inconsistencies in behaviour and values salient.

MEJ are rationalisations of animal product consumption through the use of argumentation (Graça et al., 2016). Common justifications include the notions that eating meat is necessary for survival, normal human behaviour, and delicious (Rothgerber, 2020). These arguments reflect the idea that eating meat is a standard part of the human experience, endorse human dominance over animals, and further perpetuate meat consumption. Higher levels of justification are linked to higher levels of consumption, less guilt in doing so, and less openness to meat substitutes (Rothgerber, 2020).

DNC is the act of understating and dismissing the negative influences of consuming animal products on the environment, health, and animal welfare (Graça et al., 2016). The suffering of animals is downplayed, for example, by denying that animals have the ability to think, feel, and suffer the way humans do (Rothgerber, 2020). This process is supported by factory farms, animal product companies, and institutions that put much effort into concealing the adverse impact (Rothgerber, 2020). This is done for example by labeling products “organic”, “humane”, and “free-range” which falsely imply a marked decrease in animal suffering, environmental, and health impact (PETA, 2021; Thibault et al., 2022). These strategies, among others, help reduce the cognitive dissonance state, thereby decreasing the likelihood of behavioural change. Thus, use of

CDRSs allows for a continuation of human domination and exploitation of animals for the sake of animal product consumption.

Much of the previous research primarily investigated CDRSs in the context of meat and has found a stable link between the extent of meat consumption and use of CDRSs. Meanwhile, the exploration of CDRS use in dietary groups other than omnivores has only recently gained attention and suggests that pescatarians, vegetarians, and vegans also seem to engage in mechanisms to relieve their negative arousal state, though differing in extent of engagement and type. Ioannidou et al. (2023b) found that omnivores use more MEJ efforts regarding their dietary preference compared to pescatarians, who in turn use more justification compared to vegetarians and vegans. This indicates that those who engage in more plant-based diets find it less justifiable to dominate and exploit animals for human consumption which is reflected in their behaviour. Moreover, there are differences in the extent to which different dietary groups engage in WI. Those more committed to meat consumption were also likely to engage in more WI compared to those who followed more plant-based diets, that is, vegetarians and vegans (Leach et al., 2022). This aids omnivores to feel less negative emotions such as guilt by reducing cognitive dissonance states and thereby contributes to a continuation of meat consumption (Ioannidou et al., 2023b). Dietary groups seem to engage in different kinds of DNC which are in line with their diet. Meat-eaters and pescatarians were more likely to deny that animals killed for meat and fish have the capacity to experience pain and suffering than vegetarians and vegans (Bastian et al., 2011; Ioannidou et al., 2023b). Those dietary groups who consume egg and dairy also engaged in more denial of suffering within the egg and dairy industry than vegans (Ioannidou et al., 2023b). This implies that the DNC is selectively applied to certain contexts that are relevant to the specific dietary group, for example, vegetarians apply it more to the dairy and egg industry than to the meat and fish industry. This paper investigates the use of CDRSs in order to further increase the body of evidence for their use in not only omnivores but also pescatarians, vegetarians, and vegans. For this, I hypothesise that there will

be an overall gradient in usage of CDRSs from high to low in the following order: omnivores, pescatarians, vegetarians, and vegans.

These differences in usage of CDRSs and choice of diets seem to also be influenced by the individual's ideological orientation. Rothgerber, (2020) highlights in his research that especially *right-wing authoritarianism* (RWA) is related closely to the endorsement and rationalisation of animal exploitation. Altemeyer (1981) developed this broad conceptual framework that encompasses three ideological attitudinal clusters: *conventionalism, authoritarian submission*, and *authoritarian aggression*. Conventionalism is the adherence, commitment to, and desire to maintain traditional social norms, values, and rules (Dunwoody & Funke, 2016). Authoritarian submission describes the unquestioned acceptance and compliance to authority figures (Rattazzi et al., 2007). Authoritarian aggression is the tendency to express hostility to out-group members, those who violate social conventions, and deviants (Heller et al., 2020). Those who score high on RWA tend to prioritise high levels of conformity, consistency, as well as uniformity and they believe in a social hierarchy (Sinclair et al., 2020). RWA may be connected to dietary choice and CDRSs in two ways.

Firstly, it seems to impact the use of CDRSs. Sinclair et al. (2020) found an association between RWA and close-mindedness. Their research highlights that individuals who are high in RWA tend to resist changing their cognition through belief updating. This is corroborated by Kerr and Wilson (2021), who discovered that RWA is linked to maintaining previously held beliefs in the face of scientific information which contradicts these beliefs. This suggests that those scoring high on RWA might avoid changes to their diet by resisting changing their cognition around this topic despite scientific consensus of the negative impact of animal consumption. This connection might be facilitated through higher usage of the cognitive dissonance reduction mechanisms WI, MEJ, and DNC.

Secondly, RWA has been found to be connected to the consumption of animal products (Dhont et al., 2014). High endorsement of RWA is linked to a higher commitment to and justification of meat consumption (Monteiro et al., 2017). This may be because meat symbolises

ideas of RWA such as domination, aggression, and exploitation of out-groups, maintaining traditional norms, and conformity (Rothgerber, 2020). In contrast, those who reject the ideas of hierarchy, domination, and traditionalism were more likely to be vegetarian. This implies an association between RWA and choice of diet, with levels of RWA being highest in omnivores. However, existing literature has not shed light on whether these findings also extend to pescatarians and vegans. As pescatarians consume fewer animal products than omnivores, but more than vegetarians, one could speculate that levels of RWA in this dietary group are lower compared to omnivores and higher compared to vegetarians. Continuing this line of reasoning, vegans would score lowest on RWA as they consume no animal products. This would be shown in findings of RWA score being highest in omnivores, then pescatarians, then vegetarians, and lowest in vegans.

This suggests that RWA plays an influential role in choice and maintenance of diet through the use of CDRSs. However, the connection of RWA with both choice of diet and CDRSs has not gained much attention from the scientific community. Therefore, I want to investigate how RWA influences the relationship between dietary choice and usage of CDRSs. For this, I hypothesise that those scoring higher on RWA engage in more of the cognitive dissonance reduction mechanisms MEJ, DNC, and WI compared to those who score lower in each dietary group. This inquiry is important to increase the understanding of the underlying connection between these variables in order to better inform policy-making, activism, and consumer choices for the purpose of decreasing animal product consumption.

Method

Participants

The study used a convenience sample consisting of 161 participants, of which 71.4% (*n* = 115) identified as female, 21.7% (*n* = 35) identified as male, 1.2% (*n* = 2) identified as non-binary, and 5.6% (*n* = 9) did not disclose their gender identity. The sample's mean age was 33.2 years (*SD* = 14.971), with the youngest being 18 years old and the oldest 93 years old. The participants chose the following labels to best describe their dietary choices: 34.2% (*n* = 55) omnivore, 26.7 % (*n* =

43) flexitarian, 5% (*n* = 8) pescatarian, 17.4% (*n* = 28) vegetarian, 13.7% (*n* = 22) vegan, and 3.1% (*n* = 5) other. After inspecting the collected data some adjustments were made to the labeling so that the distribution of diets was 63.4% (*n* = 102) omnivore, 6.8% (*n* = 11) pescatarian, 16.8% (*n* = 27) vegetarian, and 13% (*n* = 21) vegan.

Design and Data Analysis

This correlational study investigated the relationship between the independent variables choice of diet as well as RWA, and the dependent variable use of CDRSs. The dependent variable was divided into two continuous variables MEJ and DNC, and a categorical variable WI. The collected data was analysed by calculating Spearman's and Pearson correlations, performing a MANOVA, and a multiple regression analysis to investigate for a moderation effect.

Procedure

The study was approved by the ethics committee of the University of Groningen Faculty of Behavioural and Social Sciences. For the study, the participants were recruited by psychology students at the University of Groningen as part of their bachelor thesis. To reach the participants the link to the questionnaire was shared using the snowball technique. At the start of the survey, the participants were asked to give their informed consent and received an information slip about the duration of the study. There was no compensation for participation. The survey was created by six bachelor students whose scales all concerned the topic of dietary choices. The data was collected between November 29th and December 4th, 2023.

Measures

Choice of Diet

Choice of diet was measured using a multiple-choice question ("What is your dietary choice right now?") with the following answer options: omnivore, flexitarian, pescatarian, vegetarian, vegan, and other. The chosen labels were adjusted according to the reported extent of animal product consumption, assessed by another question (How often do you consume the following?). Participants indicated their frequency of consuming meat, fish, eggs, and dairy in an average week.

Answer options for this question were: Never, once, 2-3, 4-5, 6-7, and more than once a day. Some dietary data points were changed as the chosen label did not correspond to the reported frequency of animal consumption (e.g., some vegetarians reported eating fish, so they were labeled as pescatarian). Moreover, flexitarians were placed in the overreaching category of omnivores as both diets largely overlap.

Cognitive Dissonance Reduction Strategy

The three CDRSs were measured using a mixture of items and an option to get further information. Use of MEJ and DNC was measured with one modified item each from the *Moral Disengagement in Meat Questionnaire* (MDMQ). "All things considered, animal products are necessary for the human diet." measured the use of MEJ, and "By eating animal products I engage in an industry responsible for major damages." measured DNC (Graça, Calheiros, & Oliveira, 2016). The participants indicated the degree to which they agreed with each item on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). The data of the DNC item was recoded before the analysis so that high scores represented high denial of negative consequences. The decision to measure using one item each was made to simplify and shorten the questionnaire. Moreover, the two items were chosen because the phrasing was more general and milder compared to the other items, thereby allowing for the detection of more subtle fluctuations in opinions within the sample. The word "meat" was substituted with "animal product" to be inclusive of pescatarians, vegetarians, and vegans. Furthermore, WI was measured as a dichotomous variable through the participant's choice of whether to be directed to a website providing information about animal-free diets (https://www.vegansociety.com/go-vegan/how-go-vegan) at the end of the survey or whether they preferred not to gain further information. Those who wanted to receive further information were coded as not engaging in WI and those who did not want to receive the information were coded as engaging in WI.

Right-Wing Authoritarianism

To measure RWA, participants were asked to complete a ten-item RWA scale. Upon inspecting the existing validated shortened version of Altemeyer's RWA scale (Rattazzi et al., 2007), the need to adapt the scale became clear. The reason is that the wording of the items was extreme, for example, "What our country really needs is a strong, determined leader who will crush evil, and take us back to our true path." (Rattazzi et al., 2007). Asking the participant's opinion on such extreme items could have caused a floor effect, rendering the results to be inconclusive. Thus, I adapted multiple validated scales to create a new RWA scale with milder items (see Appendix A for the adapted RWA scale; Heller et al., 2020; Bizumić & Duckitt, 2018; Rattazzi et al., 2007). An example of a moderated statement is: "Obedience and respect for authority are important values children should learn." instead of "Obedience and respect for authority are the most important values children should learn." This new scale asked the participants to rate the degree to which they agree with each item on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Items 1, 4, 5, 8, and 9 were worded in the opposite direction of the other items, so they were recoded before the analysis.

Results

All 161 participants were included in my data analysis because they filled out all relevant information concerning choice of diet, RWA, and use of CDRSs. Most participants were omnivores, followed by vegetarians, then vegans, and lastly pescatarians. The distribution of diets can be seen in Table 1 below.

Table 1

Frequency of Omnivores, Pescatarians, Vegetarians, and Vegans

Choice of Diet	Frequency	Percent
Omnivore	102	63.4
Pescatarian	11	6.8
Vegetarian	27	16.8
Vegan	21	13.0
Total	161	100.0

The scale for RWA had a Cronbach's alpha of $\alpha = .74$ which indicates that the construct of RWA was reliably measured. The average for RWA was calculated for each participant by computing the mean answer of all RWA items. The overall average was $M = 2.06$ ($SD = 0.51$). Averages of MEJ and DNC were $M = 2.59$ ($SD = 1.33$) and $M = 1.81$ ($SD = 1.05$), respectively. 109 (67.7%) participants engaged in WI.

Before investigating specific hypothesized relationships between particular variables, I was interested in exploring the strength and directions of the associations between all of the variables. To do this, choice of diet was considered as an ordinal variable, ranking the consumption of animal products as follows: omnivore, pescatarian, vegetarian, and vegan. The correlation between ordinal and continuous variables is calculated using Spearman's correlation, while the Pearson correlation shows the association between continuous variables. Therefore, the correlations between choice of diet and the other variables are Spearman's correlations and all other correlations are Pearson correlations. The correlation analysis revealed many significant results; see Table 2.

Table 2

Correlations of Dependent and Independent Variables

Variable	1	2	3	4	5
1. Choice of Diet	—				
2. Right-Wing Authoritarian	-.33[a]**	—			
3. Means-Ends Justifications	-.50[a]**	.42[b]**	—		
4. Denial of Negative Consequences	-.43[a]**	.42[b]**	.39[b]**	—	
5. Wilful Ignorance	.03[a]	.08[b]	.03[b]	.04[b]	—

Note. $N = 161$.

[a]Spearman's correlation. [b]Pearson correlation.

**Correlation is significant at .001 level

Dietary choice was significantly negatively correlated with RWA ($r_s(159) = -.33$, $p < .001$), MEJ ($r_s(159) = -.50$, $p < .001$), and DNC ($r_s(159) = -.43$, $p < .001$) This indicates that the more animal-based the participant's diet (i.e., omnivores and pescatarians), the more likely they were to score high in RWA, use of MEJ, and DNC compared to those whose diets were more plant-based (i.e., vegetarians and vegans). Furthermore, RWA was moderately positively correlated with MEJ ($r(159) = .42$, $p < .001$) and DNC ($r(159) = .42$, $p < .001$). This implies that people high in RWA also scored higher on use of MEJ and DNC compared to those who are low in RWA. MEJ and DNC were moderately positively correlated ($r(159) = .39$, $p < .001$) so those who engaged in more MEJ were also likely to engage in more DNC.

To test whether there is a gradient in use of CDRSs from high to low for omnivores, pescatarians, vegetarians, and vegans respectively, I performed a multivariate analysis of variance (MANOVA); see Table 3.

Table 3

Tests of Between-Subjects Effects

Choice of Diet	$F(3,157)$	p	η_p^2
Means-Ends Justifications	17.39	< .001	.25
Denial of Negative Consequences	8.87	< .001	.15
Wilful Ignorance	0.11	.957	<.01

Note: Corrected Model.

The MANOVA revealed large statistically significant differences between the independent groups on the measure of MEJ ($F(3,157) = 17.39$, $p < .001$, $\eta_p^2 = .25$) and DNC ($F(3,157) = 8.87$, $p < .001$, $\eta_p^2 = .15$). There was no statistically significant difference between groups in their use of WI ($p = .957$). To specify which of the groups differed in denial and justification strategies of animal product consumption, I performed a Bonferroni post hoc test that compared each dietary group with one another for MEJ and DNC; see Table 4.

Table 4

Multiple Comparisons (Post Hoc Tests)

CDRSs	Choice of Diet		Mean Difference	SE	*p*
Means-Ends Justifications	Omnivore	Pescatarian	0.58	0.37	.720
		Vegetarian	0.92*	0.25	.002
		Vegan	1.89*	0.28	<.001
	Pescatarian	Vegetarian	0.34	0.42	1.000
		Vegan	1.31*	0.43	.017
	Vegetarian	Vegan	0.97*	0.38	.028
Denial of Negative Consequences	Omnivore	Pescatarian	0.54	0.31	.491
		Vegetarian	0.61*	0.21	.028
		Vegan	1.09*	0.23	<.001
	Pescatarian	Vegetarian	0.06	0.35	1.000
		Vegan	0.55	0.36	.812
	Vegetarian	Vegan	0.48	0.28	.553

Note: Multiple Comparisons using the Bonferroni Method. Based on observed means.

The error term is Mean Square(Error) = 0.224.

*The mean difference is significant at the .05 level.

The post hoc tests revealed that the use of MEJ was statistically significantly lower for vegetarians (2.11 ± 0.22, $p = .002$) and vegans (1.14 ± 0.25, $p < .001$) compared to omnivores (3.03

± 0.12), indicating that vegetarians and vegans tend to justify their diets less than omnivores. Omnivores also engage in significantly higher usage of DNC (2.09 ± 0.10) compared to vegetarians (1.48 ± 0.19, $p = .028$) and vegans (1.00 ± 0.21, $p < .001$). This implies that omnivores tend to deny the negative consequences of and justify consuming animal products more than vegetarians and vegans do. Pescatarians only differed significantly in use of MEJ (2.46 ± 0.35) from vegans (1.14 ± 0.25, $p < .017$). Pescatarians did not differ significantly from other dietary groups concerning DNC. This suggests that pescatarians use more justifications of their diet than vegans do, while not differing from omnivores or vegetarians. The significant findings support the idea that denying the negative consequences of animal product consumption and justifying it is influenced by dietary choice.

However, the question stands whether differences in CDRS use are exclusively influenced by choice of diet or whether another variable may increase the predictability. Therefore, I investigate whether choice of diet is a stronger predictor of usage of CDRSs, for higher RWA scores. For this, I tested for a moderation effect by performing a moderated multiple regression analysis to assess to what extent the predictability increases when adding the covariate RWA. In the Model Summary H_0 assumes no moderation effect and therefore shows the relationship between choice of diet and CDRSs without accounting for RWA. H_1 tests this relationship after adding the extra predictor RWA. The results show that only including choice of diet explains 25% of the variance of MEJ and 15% of the variance of DNC compared to including no predictors. Adding the moderator RWA increases the explained variance of scores on MEJ and DNC, by 14% and 11%, respectively. This means that considering RWA as well as dietary choice explains the use of denial and justification strategies better than just accounting for choice of diet. The results are presented in Table 5.

Table 5

Model Summary of Means-Ends Justification, Denial of Negative Consequences, and Wilful Ignorance

	Model	R^2	R^2_{adj}	R^2 change	F change	p
Means-Ends Justifications	H_0	.25	.24	.25[a]	17.39[a]	< .001
	H_1	.36	.33	.11	6.47	< .001
Denial of Negative Consequences	H_0	.15	.13	.15	8.87	< .001
	H_1	.28	.25	.14	7.44	<.001
Wilful Ignorance	H_0	<.01	-.02	<.01	0.11	.96
	H_1	.02	-.03	.02	0.41	.89

Note. The null model includes choice of diet.

[a]This illustrates the change from a model with no predictors.

The moderation effect is visualised below in Figure 1 and 2.

Figure 1

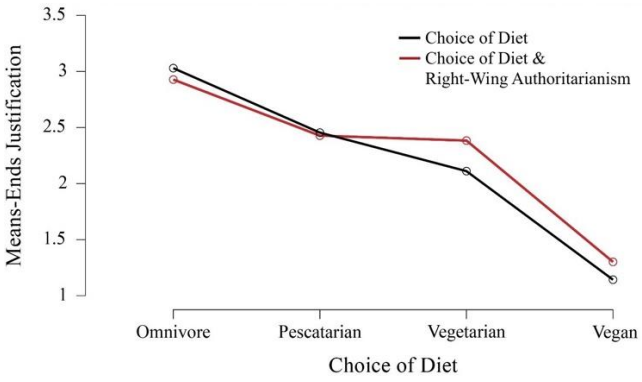
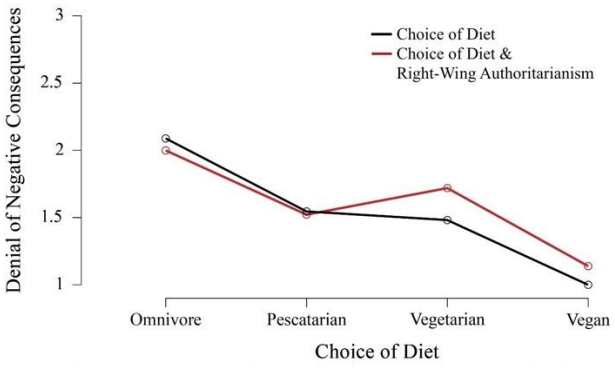


Figure 2



Figures 1 and 2 depict that levels of MEJ and DNC differ in each dietary group depending on whether RWA is included in the model. However, exactly how RWA moderates this relationship is still unclear. Thus, further inquiry into whether those scoring higher on RWA engage in more CDRSs compared to those who score lower in each dietary group is necessitated. Hence, I performed correlation analyses between RWA and CDRS scores within each dietary group; see Table 6.

Table 6

Pearson Correlations between Right-Wing Authoritarianism and Cognitive Dissonance Reduction Strategies within each Dietary Group

Choice of Diet	Variable	Means-Ends Justifications	Denial of Negative Consequences	Wilful Ignorance
Omnivore	Right-Wing Authoritarianism	.32**	.41**	.08
Pescatarian	Right-Wing Authoritarianism	.74*	.76*	.26
Vegetarian	Right-Wing Authoritarianism	.44*	.03	-.04
Vegan	Right-Wing Authoritarianism	-.03	–[a]	.26

Note. [a]The correlation could not be calculated because the variance in DNC for vegans is equal to 0.

The results indicate that in the group of omnivores and pescatarians RWA was moderately positively associated with use of MEJ ($r(100) = .32$, $p = .001$ for omnivores and $r(9) = .74$, $p = .010$ for pescatarians) and DNC ($r(100) = .41$, $p < .001$ for omnivores and $r(9) = .76$, $p = .007$ for pescatarians). This indicates that omnivores and pescatarians who score higher on RWA tend to also use more MEJ and DNC compared to those who score lower in their respective dietary group. There was also a moderately positive correlation in the group of vegetarians between RWA and MEJ ($r(25) = .44$, $p = .023$). This implies that vegetarians who score higher on RWA engage in more MEJ compared to those vegetarians who score lower. Interestingly, the correlation between

RWA and DNC could not be calculated for vegans. This is because all vegans in our sample indicated no denial at all.

Discussion

This study investigated the relationship between choice of diet and use of the cognitive dissonance reduction strategies denial of negative consequences, means-ends justifications, and wilful ignorance, as well as looking at the influence right-wing authoritarianism has on these associations. The statistical analysis provided evidence for associations between dietary choice and use of DNC and MEJ. The results largely support the hypothesis that the frequency of usage of CDRSs decreases progressively the fewer animal products participants consumed. In both, DNC and MEJ, there was a gradient of omnivores having the highest use, followed by pescatarians, then vegetarians, and lastly vegans. However, significant group-level differences were only observable between omnivores, vegetarians, and vegans. Additionally, RWA was significantly related to the same two CDRSs and had a moderating effect on their relationship with choice of diet. The analysis provides evidence for the hypothesis that omnivores and pescatarians scoring higher on RWA engage in more DNC and MEJ compared to those who have lower scores. Furthermore, vegetarians with higher scores on RWA used more MEJ than those with lower scores. There was no statistically significant result concerning WI.

The finding that different dietary groups vary in use of MEJ and DNC is consistent with the previous research by Ioannidou et al. (2023a) and Bastian et al. (2011) who also found that omnivores use the most justification and denial strategies, followed by pescatarians, vegetarians, and lastly vegans. This implies that higher consumption of animal products is linked to higher use of DNC and MEJ, whereas those who consume fewer animal products have lower levels of CDRS use.

On the one hand, engaging in DNC and MEJ to defend eating behaviours may facilitate the continuation of animal product consumption through decreasing negative arousal that arises when eating meat, fish, dairy, or eggs. On the other hand, it could also be the case that those who engage

in less DNC and MEJ also consume fewer animal products because they find it less defensible and thus adjust their eating behaviour. However, concerning WI this study did not have significant findings in contrast to Leach et al. (2022). Whereas they found higher animal product consumption to be linked to higher levels of WI compared to lower animal product consumption, there was no correlational indication in this study's sample, implying no apparent differences in WI between dietary groups. However, the measurement of WI was of limited accuracy which will be discussed in a later section.

The observed relationship between RWA and choice of diet in this sample supports Rothgerber's (2020) idea of RWA levels being highest in omnivores, then pescatarians and vegetarians, and lowest in vegans. This adds support for the suspected symbolic expression of RWA ideals through food choices, in which eating animal products and especially meat embodies domination, aggression towards out-groups, and maintaining traditional norms. Those who scored lower on RWA beliefs also engaged in lower animal product consumption. Their political ideals of rejecting a hierarchical worldview, conformity, and traditionalism were reflected in their decision to choose more plant-based diets. Moreover, Kerr and Wilson's (2021) claim of a link between high levels of RWA and stronger resistance to change is reflected in higher levels of MEJ and DNC in those with more authoritarian beliefs. Using more justifications and denial might be a belief-preserving measure for those with higher scores of RWA that eliminates the potential for change. However, the finding that WI has no meaningful association with RWA conflicts with this explanation. It also contrasts Sinclair et al.'s (2020) idea that more RWA is connected to close-mindedness and unwillingness to expose oneself to new information, but again, the null result may have been a measurement error.

Yet, the overall hypothesis that RWA interacts with choice of diet concerning the level of MEJ and DNC was supported, and, as far as I am aware, this finding represents the first indication of this moderation effect. One interpretation of this discovery is that RWA and dietary choice overlap in their influence on CDRSs. Therefore, more authoritarian omnivores and pescatarians

engaged in higher levels of DNC and MEJ, and more authoritarian vegetarians used more MEJ compared to less authoritarian omnivores, pescatarians, and vegetarians, respectively.

The results of this study enhance the understanding of how RWA and choice of diet interact and influence using CDRSs. The purpose of cognitive dissonance reduction CDRSs is to decrease negative arousal linked to animal consumption. Therefore, the need to change behaviour is diminished. Understanding this interplay is relevant to the development of interventions to decrease animal product consumption through inducing behavioural change. The findings that the dietary choice influences the extent of denial and justifications used, implies that intervention strategies may have to vary depending on the dietary group of interest, for example, more extensive effort is needed to foster adoption of more plant-based diets in omnivores than in vegetarians.

Moreover, the idea that RWA is associated with the choice of diet shows that food choices may be deeply rooted in an individual's ideology in that they represent values they hold. Therefore, it is crucial for activists and applied social scientists to evaluate the target group of their intervention. For example, it would be advantageous to address RWA beliefs in a more authoritarian target group to increase susceptibility to information about plant-based diets, whereas a less authoritarian target group may already be very open-minded towards plant-based diets.

Furthermore, the interaction of RWA and choice of diet implies that the two above-mentioned practical implications seem to apply simultaneously. Therefore, the interventions should be designed to accommodate the different target groups to improve their effectiveness in decreasing animal product consumption by inducing behavioural change.

Although this study's findings add to a considerable body of existing research about dietary choice, RWA, and CDRSs and have practical implications for the development of interventions, it is appropriate to recognize some limitations. Firstly, this study employed the convenience sampling method to gather participants. The survey was spread by students of the Behavioural and Social Science campus which highly influenced the distribution of dietary groups. Consequently, the different groups are neither representative of the population prevalence of omnivores, pescatarians,

vegetarians, and vegans, which would allow for result generalisations, nor are they similar in size, which would reduce potential sampling errors as well as increase reliability and precision of the group estimates. Future research into this topic may benefit from using a different sampling method, that is, random sampling to accurately represent the whole population or stratified sampling to oversample the smaller sub-populations of pescatarians, vegetarians, and vegans, thereby increasing the accuracy of analysis.

Secondly, the measure of choice of diet yielded inconclusive results in some cases. A few participants indicated that they were unaware of the meaning behind the different labels. In addition, the frequency measure did not cover all answer possibilities, for example, some vegetarian participants noted that they eat meat on special occasions. A more precise measurement could be obtained through providing definitions of each possible diet choice, as well as extending the frequency measure with an option for seldom consumption in a future study. This would enable inclusion and more accurate representation of all of the participants' dietary choices, thereby increasing content validity.

Thirdly, the operationalisation of CDRSs was limited, therefore it is questionable whether the measurements achieved adequate levels of construct validity. DNC and MEJ were only assessed using one item each. These items were phrased as statements that are interpretable as showing DNC and MEJ, however, could also reflect unknowingness. Furthermore, WI was measured as a dichotomous variable through examining whether participants wanted to receive more information about plant-based after the survey. Instead of accurately assessing WI, the results could also reflect participant's unwillingness to engage with further information after finishing the survey. Many vegans also indicated that they did not wish to receive further information, which conflicts with a hypothesised gradient in usage. However, this response is understandable as vegans likely already have knowledge of the issues and therefore is not a suitable indication of WI. This circumstance may be the reason for insignificant results. Therefore, it is of interest whether more accurate measures would yield significant results for all CDRSs. Future research may focus on improving

the operationalisation of the CDRSs through a more explicit WI measure and multiple items per strategy, to ensure higher construct validities.

Furthermore, it would be useful to investigate and extend the current finding of the interaction of RWA and choice of diet on cognitive dissonance strategies. Shedding more light on the interplay of these variables is of great importance, especially as it may have further implications for the development of interventions to decrease animal product consumption.

This study's results show that choice of diet is significantly related to the extent of using MEJ and DNC. The extent of engaging in these CDRSs decreases progressively from high to low for omnivores, pescatarians, vegetarians, and vegans, respectively. Overall, individuals holding stronger RWA beliefs used more justifications and denial compared to individuals who rejected these beliefs. This effect could also be seen within omnivores, pescatarians, and vegetarians so that an interaction effect between RWA and dietary choice seems to exist. More authoritarian individuals in these dietary groups were more likely to engage in higher levels of CDRSs than less authoritarian individuals. These findings enhance the understanding of the interplay of RWA and choice of diet in their influence on CDRSs. This understanding can benefit the process of developing interventions that aim to reduce animal product consumption and its negative impacts on the environment, health, and animal welfare.

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Appendix

Adapted Right-Wing Authoritarianism Scale

Participants indicated how much they agreed with the following statements on a scale from 'Strongly Disagree' to 'Strongly Agree'.

1. It’s great that many young people today are prepared to challenge authority and protest against outdated conventions.
2. What our society needs most is discipline, with everyone following our leaders in unity.
3. Traditional views about abortion, pornography, and marriage must be strictly followed.
4. There is nothing wrong with premarital sexual intercourse.
5. Our society does NOT need tougher government and stricter laws.
6. The facts on crime and recent public disorders show we have to crack down harder on troublemakers, if we are going preserve law and order.
7. Obedience and respect for authority are important values children should learn.
8. There is no ‘one right way’ to live life.
9. Everyone should have their own lifestyle, religious beliefs, and sexual preferences, even if it makes them different from everyone else.
10. People should leave important decisions to those in charge/the leaders.