

Article

The Relationship between Social Dominance Orientation and Dietary/Lifestyle Choices

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Abstract: This research aims to: (1) examine the construct social dominance orientation (SDO) in a setting that expands group hierarchy to include prejudices and dominance toward animals; (2) compare predictive validity and internal consistency between the 16-item SDO₆ and the 4-item SSDO; and (3) test whether the SDO₆ and the SSDO scales predict well in a consumer behavior oriented contextual setting. Predictive validity of the SSDO was almost as high as that of the SDO₆; internal reliability, however, was considerably lower. Further, as hypothesized, individuals exhibiting lower levels of SDO, as assessed by both SDO₆ and SSDO, exhibit lower levels of speciesism as well as higher levels of empathic concern. In addition, as hypothesized, ethical vegans, as compared to carnists, display lower levels of SDO and speciesism, and higher levels of empathic concern.

Keywords: social dominance orientation; SDO₆; SSDO; ethical vegan; omnivore; carnist; speciesism



Citation: Braunsberger, K.; Flamm, R.O.; Buckler, B. The Relationship between Social Dominance Orientation and Dietary/Lifestyle Choices. *Sustainability* **2021**, *13*, 8901. <https://doi.org/10.3390/su13168901>

Academic Editors: Miguel Cuerdo Mir, Luis Miguel Doncel Pedrera and Jorge Sainz-González

Received: 3 June 2021
Accepted: 31 July 2021
Published: 9 August 2021

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1. Introduction

Social dominance theory [1] suggests that in addition to social group-based hierarchies that are grounded in age and gender and common in all social systems, societies that produce sustainable economic surplus also adopt structures of social hierarchies that are arbitrarily based on group traits such as ethnic group, race, species, and religion. Within these arbitrarily set structures, group conflict and repression are generally noted, and the existing prejudices and discrimination are not only reflections of the group-based social hierarchy but also help construct and sustain it. Individuals who uphold an established group hierarchy have been shown to exhibit high levels of social dominance orientation (SDO)—defined as an “individual difference orientation that expresses the value that people place on nonegalitarian and hierarchically structured relationships among social groups” [1], p. 61. For example, previous research has shown a strong correlation between SDO and discrimination, as well as prejudicial ideologies about numerous types of groups, including religious minorities, ethnic minorities, women, and the poor [2].

SDO, as a measure of proclivity for prejudice, is usually assessed with the 16-item, 7-point, Likert-type SDO₆ scale [3]. Even though SDO₆ has been used extensively, it has been criticized for the relatively high number of scale items which is burdensome for both researcher and respondent. This common criticism targeted at longer scales has led to the trend of adopting shorter measures in personality research [4]. Another common criticism focuses on the widespread use of student samples, which has been blamed for inflating results in prejudice research [5]. Pratto et al.'s [2] research directly tackles these and other criticisms by testing the recently developed 4-item, 10-point, semantic differential Short Social Dominance Scale (SSDO) across 20 countries, using 15 languages, and show that the short scale is effective. In their research, Pratto et al. [2] focus on the relationship between SDO and attitudes toward aid to the poor, protecting minorities, and women in leadership

positions. As anticipated, low scores on the SSDO scale indicate that an individual prefers group inclusion and favors equality over dominance.

The present research has several purposes. First, it compares predictive validity and internal consistency between the 16-item SDO₆ and the 4-item SSDO in one set of studies, which to the best of our knowledge, has not been done. Second, it tests the construct social dominance orientation—a personality variable identified in psychology and used to predict social and political attitudes [6]—in a setting that expands group hierarchy to include prejudices and dominance toward animals; although this has been done previously, it has led to mixed results. That is, while Allen et al. [7] found a weak negative relationship between SDO and veganism, Dhont and Hodson's [8] results were more robust. It has been suggested that asking respondents to self-identify their dietary/lifestyle choices rather than using objective measures, in addition to not distinguishing among the different types of vegans, might be the reason for these mixed results [9]. Accordingly, the present study uses objective measures and distinguishes between types of vegans. The third purpose is to test whether the SDO₆ and the SSDO scales predict equally well in a consumer-behavior oriented contextual setting as they have in traditional psychologically-based contexts. If this third purpose can be substantiated, then the final purpose is to introduce a construct that has been the focus of research in social, personality, and group psychology to consumer research and practice, where research on these types of constructs can provide ideas on how to develop successful messages designed to help battle environmental problems, such as pollution and climate change [10,11] and hyper-consumption [12].

2. Social Dominance Orientation and Dietary/Lifestyle Choices

The vegan market is rapidly gaining importance for marketing practitioners and researchers alike as the number of vegans has experienced a rapid growth rate [13–15], leading to a sharp increase in the sales of vegan products during the past several years [16,17]. Overall global vegan food sales are expected to grow at a compound annual growth rate of 9.1% to reach \$24.3 billion in 2026 [18]. For example, the global plant meat market is currently valued at \$4.63 billion and expected to reach \$6.3 billion by 2023 [19]. As a case in point, it took less than two years for Beyond Meat's bleeding vegan burger patty to expand its reach from Whole Foods to TGI Fridays, one of the largest casual dining chains in the US, as well as to Sysco, North America's largest food distributor. Furthermore, as of 2019, plant-based options have been available in fast-food chains, including Burger King, White Castle, and Hardee's [20]. Elmhurst Dairy in Queens, New York, one of the largest dairy manufacturers on the east coast of the US has completely replaced its dairy operations with plant-based milks [21].

It has been shown that individuals are driven by different motivations to take up a plant-based diet, such as animal-related motives, self-related motives, and environment-related motives, and that these motives help predict individuals' attitudes toward animal agriculture as well as how long they remain vegan, with those driven by animal-related motives reporting to having followed a vegan diet for significantly longer than other types of vegans [22]. Accordingly, it has been suggested that marketers differentiate among the motives and then tailor their messages to specific segments in order to increase sales [22]. Hence, when comparing the 16-item SDO₆ to the 4-item SSDO, we focus on contrasting omnivores who, in the Western world, generally adhere to "the belief system in which eating certain animals [e.g., cows, pigs, etc., but *not* dogs, cats, etc.] is considered ethical and appropriate" and have been named carnists [23] to those individuals who embrace ethical veganism, which has been defined as the "personal rejection of the commodity status of nonhuman animals, of the notion that animals have only external value, and of the notion that animals have less moral value than do humans" [24]. In other words, ethical vegans are "vegan for the animals," embrace animal rights, and therefore can be expected to be against the currently dominant hierarchy that considers animals to be lesser beings and accordingly display a lower level of SDO than carnists. Thus, the first hypothesis states:

Hypothesis 1 (H1). *Carnists display significantly higher levels of SDO, as measured by both SDO₆ and SSDO scales, than ethical vegans.*

For that reason, both SDO₆ and SSDO scales should be correlated to speciesism, which has been defined as “a prejudice or attitude of bias in favor of the interests of members of one’s own species and against those of members of other species” [25]. Speciesism has been ingrained into the dominant Western food culture, namely carnism, and it is of interest to this group to maintain a status quo that promotes the belief that it is ethical and appropriate to consume the meat of certain animals [23]. Thus, it is expected that carnists will display a higher level of speciesism than ethical vegans. Therefore, the second hypothesis posits:

Hypothesis 2 (H2). *Carnists display significantly higher levels of speciesism than ethical vegans.*

Further, SDO₆ and SSDO scales will be correlated with empathic concern, with the added expectation that carnists will display a lower level of empathic concern—defined as “the degree to which the respondent experiences feelings of warmth, compassion and concern for the observed individual” [26]—than ethical vegans. This expectation is based on prior findings that show that vegans who anthropomorphize animals display higher levels of empathic concern toward animals [27] and that lacto-ovo vegetarians (i.e., individuals who consume eggs and dairy but no meats) display lower levels of empathy than vegans [28]. Accordingly, the third hypothesis states:

Hypothesis 3 (H3). *Carnists display significantly lower levels of empathic concern than ethical vegans.*

3. Methods

All data were collected in two steps. First, participants were obtained through the Harris Panel, including members of its third-party panel providers. Although quota sampling (vegan versus nonvegan) was employed, ethical vegans were under-represented in the sample. Thus, during the second step of data collection, the assistance of animal rights and vegan organizations in the US (e.g., Vegetarian Resource Group, Mercy for Animals) was employed to help recruit ethical vegan respondents. We used a between-subjects design employing two online surveys. These surveys were identical to each other, except for the measure of SDO; that is, one of the surveys included the SDO₆ and the other survey featured the SSDO.

3.1. Study 1: Data Analyses—SDO₆

Dietary choice was assessed by asking respondents to specify which of the provided five food choice categories most closely resembled their eating habits. Given that the current research centers on investigating differences between carnists and vegans, just two of the food choice categories were pertinent, namely *I eat red meats and other foods* and *I do not eat any type of meat or any animal byproducts* [adapted from 13]. Further, as not all vegans are *ethical vegans*, all vegan respondents were subsequently asked to indicate their main motivation for going vegan and were given choices that included *my health, animal rights, weight loss, the environment, my religion, my spiritual beliefs, world hunger, and saving money*.

Of the 295 subjects completing the survey featuring SDO₆, 140 (47.5%) stated that they consume red meat and are thus deemed to be carnists. A total of 79 (26.8%) of respondents reported that they do not eat any type of meat or any animal byproducts *and* are ethical (i.e., animal rights) vegans. The remaining 76 (25.8%) of respondents were either pescopollo vegetarians (i.e., avoid red meat but eat fish and/or poultry), lacto-ovo vegetarian (i.e., do not eat any type of meat, but consume eggs and/or dairy), or went vegan for non-animal rights reasons and were therefore excluded from the analysis (see Table 1 for the demographic profile of the reduced sample).

Table 1. Demographic characteristics of study 1 sample (N = 219).

		Frequency	Percent
Gender	Male	91	41.6
	Female	128	58.4
Age	18–20	13	5.9
	21–29	49	22.4
	30–39	43	19.6
	40–49	35	16.0
	50–59	36	16.4
	60–69	23	10.5
Current Relationship Status	70 or older	20	9.1
	Married	106	48.4
	Widowed	5	2.3
	Divorced	18	8.3
	Separated	1	0.5
	In a domestic partnership or civil union	9	4.1
	Single, but cohabiting with a significant other	21	9.6
Level of Education	Single, never married	59	26.9
	Less than high school degree	3	1.4
	High school degree or equivalent (e.g., GED)	26	11.9
	Some college but no degree	48	21.9
	Associate degree	18	8.2
	Bachelor's degree	75	34.2
	Graduate degree	49	22.4

3.1.1. SDO₆

The reliability of the scale was very high ($\alpha = 0.91$), and all 16 items did well on the Cronbach's Alpha measure. We first ran an unrotated principal axis factor analysis on the data, which revealed two factors. The first factor had an eigenvalue of 7.04 and explained 44.01% of the variance; the second factor had an eigenvalue of 3.44 and explained 21.52% of the variance. Both factors together featured explanatory power of 65.53%. The rotated factor analysis, using Varimax, showed that the first factor summarized the eight items that have been shown to measure SDO-Dominance and the second factor the eight items that measure SDO-Egalitarianism [29] (see Table 2 for items means, standard deviations, and factor loadings).

Table 2. SDO₆, scale items, item means and standard deviations, and factor loadings.

SDO-Dominance: Preference for Some Groups to Dominate Others/Support for Group-Based Dominance Hierarchies			
	Item Means	SD	Factor 1 Loadings
Some groups of people are just more worthy than others.	2.55	1.85	0.728
In getting what your group wants, it is sometimes necessary to use force against other groups.	2.89	1.81	0.720
Superior groups should dominate inferior groups.	2.49	1.73	0.821
To get ahead in life, it is sometimes necessary to step on other groups.	2.90	1.84	0.804
If certain groups of people stayed in their place, we would have fewer problems.	2.85	1.93	0.827
It's probably a good thing that certain groups are at the top and other groups are at the bottom.	2.88	1.90	0.764
Inferior groups should stay in their place.	2.38	1.68	0.836
Sometimes other groups must be kept in their place.	2.84	1.84	0.849
SDO-Egalitarianism: Preference for Nonegalitarian Intergroup Relations/Opposition to Group-Based Equality			
	Item Means	SD	Factor 2 Loadings
It would be good if all groups could be equal. *	2.33	1.56	0.845
Group equality should be our ideal. *	2.45	1.64	0.856
All groups should be given an equal chance in life. *	1.73	1.18	0.608
We should do what we can do to equalize conditions for different groups. *	2.44	1.61	0.822
Increased social equality would be a good thing. *	2.09	1.49	0.818
We would have fewer problems if we treated different groups more equally. *	2.31	1.56	0.839
We should strive to make incomes more equal. *	2.53	1.78	0.777
No one group should dominate in society. *	2.18	1.51	0.658

Note: Jost and Thompson [3], 1 = strongly disagree/disapprove; 2 = disagree; 3 = somewhat disagree; 4 = neither disagree nor agree; 5 = somewhat agree; 6 = agree; 7 = strongly agree/approve; * reverse coded.

One aim of the present research is to compare SDO₆ and SSDO. Since Pratto et al. [2] found that the SSDO scale only had one dimension, and our hypotheses do not advance differential outcomes depending on teasing apart SDO-Dominance and SDO-Egalitarianism, the 16-item scale was collapsed into a summary variable ($m = 2.49$; $SD = 1.11$; range = 6.0), where higher scores denote a higher level of SDO.

3.1.2. Speciesism

The speciesism scale consists of eight 7-point Likert items [30] (see Table 3 for item means, standard deviations, and Cronbach's Alpha). Higher scores on the summary measure ($m = 3.22$; $SD = 1.56$; range = 5.38) signify a higher level of speciesism.

Table 3. Speciesism scale items, item means, and standard deviations.

	Study 1; N = 219; $\alpha = 0.88$		Study 2; N = 290; $\alpha = 0.90$	
	Item Means	SD	Item Means	SD
Animal research cannot be justified and should be stopped. *	3.30	2.08	2.82	2.08
The production of inexpensive meat, egg, and dairy products justifies maintaining animals under crowded conditions.	2.72	1.94	2.19	1.80
The use of animals in rodeos and circuses is cruel.*	2.94	1.91	2.34	1.88
I get upset when I see wild animals in cages at zoos. *	3.33	2.08	2.62	1.94
I think it is perfectly acceptable for cattle, chickens, and pigs to be raised for human consumption.	4.32	2.53	3.30	2.51
I have seriously considered becoming a vegetarian in an effort to save animal lives. *	4.10	2.57	3.04	2.49
I think human economic gain is more important than setting aside land for wildlife.	2.48	1.69	2.05	1.56
There is nothing wrong with killing animals for their fur to make clothes (fur coats).	2.58	1.99	2.19	1.78

Note: Dhont et al. [30]; 1 = strongly disagree to 7 = strongly agree; * reverse coded.

3.1.3. Empathic Concern

The empathic concern scale was adapted from Davis [26] to be comprised of seven 7-point items (assessed from 1 = does not describe me well to 7 = describes me very well). Higher scores on the summary measure ($m = 5.40$; $SD = 1.17$; range = 5.29) show a higher level of empathic concern (see Table 4 for item means, standard deviations, and Cronbach's Alpha).

Table 4. Empathic concern scale items, item means, and standard deviations.

	Study 1; N = 219; $\alpha = 0.84$		Study 2; N = 290; $\alpha = 0.83$	
	Item Means	SD	Item Means	SD
When I see someone being taken advantage of, I feel kind of protective toward them.	5.61	1.53	5.96	1.42
When I see someone being treated unfairly, I sometimes don't feel very much pity for them. *	5.74	1.65	6.03	1.55
I often have tender, concerned feelings for people less fortunate than me.	5.34	1.61	5.89	1.45
I would describe myself as a pretty soft-hearted person.	5.28	1.65	5.59	1.55
Sometimes I don't feel sorry for other people when they are having problems. *	5.01	1.81	5.07	1.97
Other people's misfortunes do not usually disturb me a great deal. *	5.40	1.71	5.60	1.70
I am often quite touched by things that I can see happen.	5.42	1.61	5.81	1.41

Note: adjusted from Davis [26]; measured from 1 = does not describe me well to 7 = describes me very well; * reverse coded.

3.1.4. Correlations

Pearson correlations show a strong, highly significant, positive relationship between speciesism and SDO_6 ($r = 0.514$; $p = 0.000$) as well as a moderate, highly significant, negative relationship between empathic concern and SDO_6 ($r = -0.456$; $p = 0.000$) (see Table 5 for more detail on the statistical analyses).

Table 5. Statistical details for SDO₆ and SSDO scales.

Study 1							Correlations with SDO ₆ Scale			
	M SDO ₆	SD	Range	Skewness	α	N	Speciesism		Empathic Concern	
							r	p-Value	r	p-Value
Complete Sample	2.49	1.11	6.00	0.59	0.91	219	0.514	0.000	−0.456	0.000
Carnists	2.78	1.02	4.38	0.05	0.88	140	0.303	0.000	−0.451	0.000
Ethical Vegans	1.97	1.09	6.00	1.96	0.94	79	0.655	0.000	−0.236	0.036
Study 2							Correlations with SSDO Scale			
	M SSDO	SD	Range	Skewness	α	N	Speciesism		Empathic Concern	
							r	p-Value	r	p-Value
Complete Sample	2.31	1.14	4.50	0.47	0.65	288	0.350	0.000	−0.429	0.000
Carnists	2.62	1.19	4.50	0.24	0.61	146	0.265	0.001	−0.463	0.000
Ethical Vegans	1.99	1.01	3.75	0.64	0.63	142	0.163	0.053	−0.297	0.000

3.1.5. One-Way ANOVA

One-way ANOVA was used to test the hypotheses. The analyses show, as theorized, that ethical vegans exhibit a statistically significant (1) lower level of SDO ($m = 1.97$; $F = 30.169$; $p = 0.000$; $\eta^2 = 0.122$) than carnists ($m = 2.78$); (2) lower level of speciesism ($m = 1.52$; $F = 449.996$; $p = 0.000$; $\eta^2 = 0.675$) than carnists ($m = 4.18$); and (3) higher level of empathic concern ($m = 5.98$; $F = 35.188$; $p = 0.000$; $\eta^2 = 0.140$) than carnists ($m = 5.07$). The three partial eta square values (η^2) show effect sizes that are medium to large. (See Tables 6 and 7 for more detail on the statistical analyses). Therefore, H_1 , H_2 , and H_3 can be supported.

Table 6. Study 1 descriptive statistics.

		N	Mean	SD	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
SDO ₆	Carnists	140	2.78	1.02	0.086	2.6099	2.9500
	Ethical Vegans	79	1.97	1.09	0.122	1.7306	2.2172
	Total	219	2.49	1.11	0.075	2.3413	2.6370
Speciesism	Carnists	140	4.18	0.92	0.078	4.0270	4.3355
	Ethical Vegans	79	1.52	0.84	0.094	1.3305	1.7044
	Total	219	3.22	1.56	0.106	3.0124	3.4282
Empathic Concern	Carnists	140	5.07	1.13	0.096	4.8833	5.2616
	Ethical Vegans	79	5.98	1.02	0.114	5.7560	6.2114
	Total	219	5.40	1.17	0.079	5.2448	5.5576

Table 7. Study 1 ANOVA Table.

		Sum of Squares	df	F	p-Value	Partial Eta Squared
SDO ₆	Between Groups	32.810	1	30.169	0.000	0.122
	Within Groups	235.953	217			
	Total	268.802	218			
Speciesism	Between Groups	358.368	1	449.996	0.000	0.675
	Within Groups	172.814	217			
	Total	531.182	218			
Empathic Concern	Between Groups	41.938	1	35.188	0.000	0.140
	Within Groups	258.632	217			
	Total	300.570	218			

3.2. Study 2: Data Analysis—SSDO

A total of 404 respondents completed the survey featuring the SSDO scale. The sample was comprised of 147 (36.4%) carnists and 143 ($n = 35.4\%$) ethical vegans. The remaining 114 (28.2%) were either pesco-pollo vegetarians, lacto-ovo vegetarians, or vegan for reasons other than animal rights and were thus excluded from the data analyses (see Table 8 for the demographic profile of the final sample).

Table 8. Demographic characteristics of study 2 sample (N = 290).

		Frequency	Percent
Gender	Male	88	30.3
	Female	202	69.7
Age	18–20	12	4.1
	21–29	63	21.7
	30–39	53	18.3
	40–49	49	16.9
	50–59	60	20.7
	60–69	34	11.7
	70 or older	19	6.6
Current Relationship Status	Married	128	44.1
	Widowed	7	2.4
	Divorced	35	12.1
	Separated	5	1.7
	In a domestic partnership or civil union	14	4.8
	Single, but cohabiting with a significant other	39	13.4
	Single, never married	62	21.4
Level of Education	Less than high school degree	3	1.0
	High school degree or equivalent (e.g., GED)	30	10.3
	Some college but no degree	58	20.0
	Associate degree	29	10.0
	Bachelor degree	94	32.4
	Graduate degree	76	26.2

3.2.1. SSDO

Internal consistency of this 4-item scale ($\alpha = 0.65$) was lower than that of the full 16-item scale ($\alpha = 0.91$). The unrotated solution of the principal axis factor analysis showed two factors, with the first factor having an eigenvalue of 1.98 and explaining 49.41% of the variance and the second factor showing an eigenvalue of 1.11 and explaining 27.79% of the variation. Together both factors explained 77.20% of the variance. The rotated factor solution, using Varimax, clearly showed two dimensions, namely SDO-Dominance and SDO Egalitarianism (see Table 9 for items means, standard deviations, and factor loadings). This outcome is not in line with Pratto et al.'s [2] findings which showed the 4-item scale to be a one-dimensional measure. To allow the comparison of SDO₆ and SSDO, the 4-item measure was collapsed into a summary variable for the remaining statistical analyses.

Table 9. SSDO, scale items, item means and standard deviations, and factor loadings.

	Item Means	SD	Factor 1 Loadings	Factor 2 Loadings
In setting priorities, we must consider all groups.	2.22	1.56	0.916	
We should not push for group equality. *	2.70	1.90		0.815
Group equality should be our ideal.	2.38	1.57	0.891	
Superior groups should dominate inferior groups. *	1.94	1.53		0.848

Note: Pratto et al. [2]; from 1 = extremely oppose to 10 = extremely favor; * reverse coded.

3.2.2. Correlations

The Pearson correlations between SSDO and speciesism show a moderate, highly significant, positive relationship ($r = 0.350$; $p = 0.000$), as well as moderate, highly significant, negative relationship between SSDO and empathic concern ($r = -0.429$; $p = 0.000$) (see Table 5 for more detail).

3.2.3. One-Way ANOVA

One-way ANOVA was used to test the hypotheses. The analyses show, as theorized, that ethical vegans exhibit a statistically significant (1) lower level of SSDO ($m = 1.99$; $F = 23.133$; $p = 0.000$; $\eta^2 = 0.075$) than carnists ($m = 2.62$); (2) lower level of speciesism ($m = 1.28$; $F = 557.257$; $p = 0.000$; $\eta^2 = 0.659$) than carnists ($m = 3.82$); and (3) higher level of empathic concern ($m = 6.01$; $F = 21.709$; $p = 0.000$; $\eta^2 = 0.070$) than carnists ($m = 5.42$). Again, the partial eta square values (η^2) show medium to large effect sizes (see Tables 10 and 11 for more detail on the statistical analyses). Hence, H_1 , H_2 , and H_3 can be supported.

Table 10. Study 2 descriptive statistics.

		N	Mean	SD	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
SSDO	Carnists	146	2.62	1.19	0.098	2.4272	2.8160
	Ethical Vegans	142	1.99	1.01	0.085	1.8265	2.1629
	Total	288	2.31	1.15	0.068	2.1794	2.4456
Speciesism	Carnists	147	3.82	1.16	0.096	3.6333	4.0113
	Ethical Vegans	143	1.28	0.57	0.048	1.1837	1.3723
	Total	290	2.57	1.57	0.092	2.3863	2.7491
Empathic Concern	Carnists	147	5.42	1.06	0.088	5.2416	5.5883
	Ethical Vegans	143	6.01	1.10	0.092	5.8251	6.1889
	Total	290	5.71	1.12	0.064	5.5819	5.8363

Table 11. Study 2 ANOVA Table.

		Sum of Squares	df	F	p-Value	Partial Eta Squared
SDO ₆	Between Groups	28.287	1	23.133	0.000	0.075
	Within Groups	349.713	286			
	Total	378.000	287			
Speciesism	Between Groups	469.239	1	557.257	0.000	0.659
	Within Groups	242.511	288			
	Total	711.750	289			
Empathic Concern	Between Groups	25.406	1	21.709	0.000	0.070
	Within Groups	337.047	288			
	Total	362.454	289			

4. Discussion

The results of our research are in line with Pratto et al.'s [2] study that found the predictive validity of the SSDO to be comparable to that of the SDO₆. Although the internal reliability of the SSDO as assessed in our research ($\alpha = 0.65$) is relatively low, it is actually on the higher end when compared to Pratto et al.'s 20-country study, where α ranged from a low 0.34 for Turkey to a high 0.80 for the US, with a mid-point of 0.60. More importantly, Pratto et al. [2], p. 590 used Rodriguez and Maeda's [31] formula to calculate a weighted average of $\alpha = 0.65$, which shows "good internal reliability for a brief scale", and is reflected in our results. These findings are of utility to researchers as well as practitioners who are more interested in predictability and want tools that lessen data collection burdens, such as long surveys. Our research, along with Pratto et al. [2], supports that this goal is possible.

As hypothesized, the findings of the present study show that carnists display a significantly higher level of social dominance orientation than ethical vegans, regardless of whether measured by the SDO₆ or SSDO. This finding is important as it demonstrates that it is legitimate to extend theories and models developed in research focusing on human social systems, hierarchies, and interactions to those that include the rest of the animal kingdom. The findings further show that carnists display a higher level of speciesism as well as a lower level of empathic concern. This is of importance to consumer researchers and social marketers as knowing a target market's level of SDO, speciesism, and empathic concern can aid in developing convincing messages designed to entice the buying or adoption by

a specific target market of one's product(s). That is, messages that de-emphasize social dominance over animals and/or a higher need for empathic concern towards animals could, for example, aid social marketers design messages that address worldwide problems such as the impact of animal agriculture on global warming [32]. As a case in point, the Food and Agriculture Organization of the UN has identified animal agriculture as the second largest contributor to human-made greenhouse gas emissions and a leading cause of deforestation, air and water pollution, as well as biodiversity loss [33]. Considering that the human population is expected to increase from 7.7 billion in 2019 to 9.7 billion in 2049, and peak at almost 11 billion by 2100 [34], animal agriculture and its negative impacts are of growing importance, as research has shown that animal agriculture increasingly strains land, water, and energy resources across the planet. Specifically, the 70 billion land animals that need to be raised every year for human consumption [35] take up approximately 30% of the planet's ice-free land surface [36] and almost 16% of global freshwater [37]. Further, 30% of worldwide grain production is used to feed livestock [38]. By 2050 meat consumption is expected to rise 76% and milk consumption 64% [33], which will lead to an increase of resources needed to support the industry. Turning our sight to the US market, beef consumption is a major concern, with average annual consumption leading to 1984 pounds of CO₂e (i.e., carbon dioxide equivalent). Replacing beef with plants would reduce that number by 96% or to 73 pounds of CO₂e [39].

Likewise, messages de-emphasizing social dominance over animals and speciesism and/or highlighting empathic concern can also aid promoters of vegan food substitutes, vegan cosmetics, vegan cleaning products, faux leather, faux fur, faux wool, and other plant-based substitutes for commonly used products. Recent research, for example, has found that using virtual reality—defined as “a computer-generated, immersive experience that allows users to step into an interactive, virtual environment, eliciting the feeling that they are actually present in this simulated reality” (p. 2)—that allows users to share the experiences of factory-farmed pigs from birth to slaughter, as compared to video documentary, has a positive impact on the presence (defined as a user's feeling of being immersed in the virtual environment) and empathic concern and leads to a decrease in the intention of eating meat [40].

5. Limitations and Suggestions for Future Research

Research limitations generally lead to suggestions for future research, and we will discuss several. The first limitation relates to our sampling. As we were specifically interested in comparing carnists to ethical vegans, fairly large portions of our samples had to be excluded, namely 76 (25.8%) in Study 1, and 114 (28.2%) in Study 2. The respondents who were excluded fall into different categories, those who do not consume red meat but poultry and/or fish and seafood, vegetarians who either eat dairy or eggs or both, as well as vegans who are refraining from the consumption of animal-derived products for reasons other than animal rights, namely health vegans, environmental vegans, etc. In our study, neither of these sub-groups was large enough for statistical purposes, but future research should include these different categories of consumers as food choices and motivations for going vegan have big implications for commerce in terms of product and promotional messaging, and therefore provide additional opportunities for more research.

Another limitation is that both of our samples exhibited limited diversity. Although care was taken to mirror the racial makeup of US society when data were collected through the Harris Panel, this was not feasible when finalizing the data collection process through animal rights and vegan organizations. Future research should specifically focus on the recruitment of vegans who are members of racial and/or ethnic minorities to test whether our findings hold or need to be expanded.

Further, unlike Pratto et al. [2], our research showed that the 4-item SSDO captured two dimensions that mirror the dimensions of the original SDO₆ scale, namely a dimension that assesses dominance and another that measures egalitarianism. Having a short scale

that reflects the dimensionality of the long scale it is to replace might be a good feature, and future studies should explore this phenomenon.

In addition, our study was set in a single context and a single country. Although we cannot guarantee that the high predictability and low-reliability relationship will hold for every given context, it is another data point that supports Pratto et al.'s findings (2013). Future research could either take our context to other countries or test the SSDO in different consumer contexts in the US, such as environmental concern, willingness to take action addressing climate change, and other areas that are focusing on ethical consumption.

Finally, future research could also focus on developing a theoretical model that provides the basis for further extension of social dominance theory. Such a model could, for example, be used to explain gaps in other consumption theories that prevent consumers from consuming ethically.

6. Conclusions

Considering the well-documented growth in veganism (ethical or otherwise), the construct is bound to be studied more, and likely across disciplines. Since our research has shown that the four-item SSDO can legitimately be used for quality research that is more respectful of respondents' time, and other authors have suggested that shorter surveys may increase response rates [41], our findings are of importance for researchers tackling both theory development and applied research that focus on studying veganism and other ethical consumption choices.

Social dominance orientation has been well established as a robust concept, and even more so based on this study. In the case of this research that spans both consumer behavior and sustainability, social dominance orientation among carnists would appear to be real. And, given the nature of the construct, it is quite plausible that the orientation of carnists is likely quite ingrained and therefore persistent. It seems logical that carnists are brought up with their beliefs, whereas ethical vegans evolve into them. Since this topic comes from the domain of psychology, there would seem to be plenty of opportunities for consumer researchers to study this construct in relevant consumer behavior contexts as well. After all, our interest in doing this research is understanding the resistance to at least eating more sustainably (and ideally moving more people closer to a vegan diet).

With respect to consumer behavior (and for that matter, where it intersects sustainability, the broader field of marketing, and perhaps even public policy), many managers/decision-makers—and certainly everyday consumers—may not be interested in the mechanics of how social dominance is manifested. They can leave this to the academics. While social dominance orientation may be strong in carnists and ingrained from childhood in many cultures, there is strong positive sentiment (especially among younger consumers, and not just the youngest) toward sustainability and “most things green” for that matter. This leaves plenty of opportunities to study the changes in the degree of social dominance orientation, the rate of change, and similar metrics.

Author Contributions: Conceptualization, K.B.; methodology, K.B., R.O.F. and B.B.; software, K.B. and B.B.; validation, R.O.F. and B.B.; formal analysis, K.B.; investigation, R.O.F.; resources, K.B.; data curation, K.B.; writing—original draft preparation, K.B.; writing—review and editing, R.O.F. and B.B.; visualization, R.O.F. and B.B.; supervision, R.O.F.; project administration, B.B.; funding acquisition, K.B. All authors have read and agreed to the published version of the manuscript.

Funding: This work was supported, in part, by the University of South Florida Research and Innovation Internal Awards Program under Grant No. 0038954. The funding source did NOT have any role in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication.

Institutional Review Board Statement: Ethical review and approval were waived for this study, due to the Institutional Review Board's (IRB) determination that our research meets criteria for exemption from the federal regulations as outlined by 45CFR46.101(b): Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or

public behavior, unless: (i) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data available upon request.

Conflicts of Interest: We have no known conflict of interest to disclose.

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