

IDEOLOGICAL AND THREAT PREDICTORS  
OF RELIGIOUS AND DIET-BASED PREJUDICE IN CANADA

by

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# Ideological and Threat Predictors of Religious and Diet-based Prejudice in Canada

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## **Abstract**

There is an increasing prevalence of negative attitudes toward vegans and vegetarians in North America. Religious reasons for diet might provide a buffering effect on prejudice towards these groups (MacInnis & Hodson, 2017). In the present thesis (Study 1), the role of socio-political ideology, threat perceptions and religious identity in understanding negative attitudes towards vegans and vegetarians, was investigated. Further, as imagined contact has been found to predict tolerant outgroup attitudes (Miles & Crisp, 2014), the relationship between imagined contact and attitudes towards vegans was studied (Study 2). Study 1 (n=406) and Study 2 (n=137) were both administered to undergraduate samples. In Study 1, religious identity had no buffering effect on attitudes towards vegans/vegetarians. Participants higher on ideology and threat held less favourable attitudes towards vegans and Sikh vegans/vegetarians. In Study 2, participants who imagined interacting with vegans reported liking them more (vs. control). Implications for future research are discussed.

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## **Introduction**

There is an increasing interest on the external impact of one's dietary choices. An overwhelming majority of the ice-free land used in food production and one-third of available fresh water in the world, is utilized to feed the livestock in the meat and dairy industries (Herrero et al., 2013). Livestock and their by-products account for roughly 51% of the green house gas emissions globally (Goodland & Anhang, 2009). Meat consumption and production levels in the developed world, including Canada, are disproportionately higher than the rest of the world (Herrero et al., 2013). Further, an increasing number of physicians and healthcare practitioners are recommending a plant-based (vegan) diet as an intervention to reduce high blood pressure, cholesterol levels, cardiovascular disease, obesity, and for prevention and management of chronic diseases like diabetes (Lee, McKay, & Ardern, 2015; Tusso, Ismail, Ha, & Bartolotto, 2013). And undercover investigations in factory farms across the Western world are bringing to light widespread practices of animal cruelty and abuse in factory farms (e.g., see Hosie, 2017). Therefore, vegan (free of any animal products) and vegetarian (meat free) diets are becoming a popular life choice in North America due to concerns about the environment, health and animal cruelty.

Five percent of Americans are vegetarian, and 2% are vegan ("In U.S., 5% Consider," 2012, as cited in MacInnis & Hodson, 2017). As the popularity of these diets has increased, it seems that negative sentiment toward vegans and vegetarians has also risen. Jokes presenting vegans and vegetarians in a negative light, for example, are ubiquitous in social situations. Negative perceptions and stereotypes of these groups are also frequently seen in print media, according to a review of discourses of veganism in leading British newspapers by Cole and Morgan (2011). There is also empirical research documenting prejudice towards vegans and

vegetarians (e.g. Earle & Hodson, 2017; Judge & Wilson, 2018; MacInnis & Hodson, 2017; Minson & Monin, 2012; Minson & Norton, 2003).

In addition to environmental and health motivations, individuals adopt a vegan or vegetarian lifestyle for religious reasons. For example, some Sikhs that belong to the Namdhari and Damdami Taksal sects are lacto-vegetarians and eschew the consumption of meat and eggs (Srivastava, 2007). In 2014, India was the second highest source of immigrants to Canada (Government of Canada, 2015). From the diverse Indian-Canadian population, Sikhs are the single largest religious group at 35% (Statistics Canada, 2007). Negative perceptions of Sikhs in an intergroup context have been documented in Canada (Zafar & Ross, 2015). Research shows that ethnic and religious majorities in Canada harbour more negative attitudes toward, and lower comfort levels with, Sikhs than other minority outgroups, with only negative attitudes towards Muslims being stronger (Kalin & Berry, 1995; Zafar & Ross, 2015). Previous research suggests that people who belong to more than one stigmatized group (e.g. Sikhs who are vegan) can experience greater prejudice or discrimination than those who belong to one stigmatized group - a phenomenon known as 'double jeopardy' (Dowd & Bengtson, 1978).

In general, the present thesis investigated diet-based prejudice, specifically prejudice towards vegans and Sikh vegans or vegetarians. In Study 1, the role of religion (Sikh vs. Christian), ideology, and threat was examined. The present thesis also explored ways to reduce prejudice toward vegans (Study 2). Specifically, the effect of imagined contact (Miles & Crisp, 2014) on prejudice toward vegans. The moderating and mediating effects of ideology and threat, respectively, were also investigated.

## **Socio-Political Ideology and Prejudice**

Since the late 20<sup>th</sup> century, a unidimensional approach for understanding and categorizing ideological social attitudes has been dropped in favour of a two-dimensional approach (Duckitt, 2001; Duckitt & Sibley, 2009). These distinct dimensions can be represented by Right-Wing Authoritarianism (RWA; Altemeyer, 1981) and Social Dominance Orientation (SDO; Pratto, Sidanius, Stallworth, & Malle, 1994). Research has demonstrated that scales for these constructs are powerful, relatively independent predictors of socio-political and intergroup attitudes, including prejudice and political orientation (Altemeyer, 1998; Duckitt & Sibley, 2009; Sidanius & Pratto, 2001; Sidanius, Cotterill, Sheehy-Skeffington, Kteily, & Carvacho, 2017).

### **Right-Wing Authoritarianism**

Right-Wing Authoritarianism (RWA) is an ideological belief that relates to values concerned with maintaining uniformity, stability, security, obedience to authorities and following social norms (Altemeyer, 1998). More specifically, RWA represents the covariation of three attitudinal clusters (Altemeyer, 1981): (1) authoritarian submission, or a high degree of submission to societally accepted authorities; (2) authoritarian aggression, or a general oppressiveness, directed at targeted individuals and allowed by established authorities; and (3) conventionalism, or abiding by social conventions perceived to be endorsed by society and its established authorities.

According to Altemeyer (1981, 1996), there are two reasons why being higher on RWA leads to intergroup prejudice. First, people higher on RWA view the world in terms of in-groups and out-groups and perceive members of out-groups as threatening traditional values. Prejudice and outgroup derogation provides an outlet for expressing hostility due to these perceived threats to ingroup values. Second, individuals higher in RWA perceive themselves as more moral than

other people and feel justified in expressing prejudice towards anyone defined by authority figures as less moral than themselves. For example, higher RWA individuals tend to hold prejudicial attitudes towards gays and lesbians condemned by religious figures (Whitley & Lee, 2000). RWA has consistently been associated with prejudice, discrimination, and hostility against members of out-groups (Duckitt & Sibley, 2017). For example, people higher in RWA were found to be prejudiced against African Americans, Native Americans, women (see Whitley, 1999), and homosexuals (Whitley & Lee, 2000).

### **Social Dominance Orientation**

Another robust ideological predictor of prejudice is social dominance orientation or SDO (Pratto et al., 1994). This ideological construct is part of Social Dominance Theory (SDT). This theory was developed to understand how group-based hierarchies are established and maintained (Pratto, Sidanius & Levin, 2006). The SDT encompasses several levels of analysis, including the level of individual differences (e.g., attitudinal and behavioural predispositions), the level of social groups in a given context, the level of institutions, and the level of competing ideologies within a social system generally (Sidanius & Pratto, 2001). The present thesis focuses on individual differences in SDO. Pratto and Sidanius (2001) proposed SDO as a theoretical tool for gauging whether specific ideological beliefs are associated with endorsement of hierarchy-enhancing (i.e. morally and intellectually justifying group-based oppression and inequality, and deeming it natural, legitimate or moral) and hierarchy-attenuating myths (i.e. ideologies that counter dominance of higher status groups or individuals). They did not consider it a root cause of social hierarchy.

The concept of SDO represents a generalized orientation towards and desire for unequal and dominant/subordinate relations among salient social groups (Pratto et al., 1994). SDO was

originally proposed as a unidimensional construct, but recent research has explored the idea of multiple facets of SDO (Ho et al., 2015). Two sub-dimensions of SDO (Ho et al., 2012) have been proposed: the dominance dimension (SDO-D) and the egalitarianism dimension (SDO-E). SDO-D represents a preference for group-based dominance hierarchies that involve active oppression of subordinate groups by dominant groups. This sub-dimension is useful for predicting support for aggression towards subordinates (Ho et al., 2012). On the other hand, SDO-E entails opposition to equality between groups, supported by a combination of subtle hierarchy enhancing beliefs and social policies (Ho et al., 2015). This sub-dimension is generally a stronger predictor than SDO-D, of support for ideologies that lead to subtle justification of inequality (e.g. Protestant work ethic) and opposition to policies that lead to more intergroup equality. Extensive research shows that SDO is related to prejudice, including sexism and ethnic prejudice against targets from different minority groups (see Pratto et al., 2006; Sidanius et al., 2017).

Together, RWA and SDO account for around 50% of the variance in generalized prejudice (Altemeyer, 1998; Duckitt, 2001). Given that RWA and SDO are robust predictors of prejudice, in the present thesis, RWA and SDO were examined as predictors of prejudice toward single outgroups (vegans) and double outgroups (Sikhs who are also vegans or vegetarians).

### **Dual Process Model: An Overview**

Incorporating RWA and SDO into a single model, Duckitt (2001) proposed the dual process model (DPM) of ideology and prejudice. According to the DPM, different sets of motivational goals or values expressed in RWA and SDO are made prominent for individuals by their social worldview beliefs, and these arise from a combination of their personalities and social environments. Also, people higher on RWA or SDO tend to perceive distinct types of



threat (Duckitt & Sibley, 2009). These different threat perceptions in turn predict socio-political and intergroup outcomes. According to the DPM, RWA is a result of viewing the world as a dangerous place (Duckitt, 2001, 2006; Duckitt et al., 2017). Viewing the social world as a ‘dangerous place’ stems from a combination of higher conscientiousness, lower openness, and socialization within dangerous and unpredictable environments. Higher levels of conscientiousness and lower openness are associated with people being higher on RWA and adopting the belief in a dangerous world (Saucier, 1994). Such a worldview also directly influences RWA levels (Duckitt & Sibley, 2009).

In contrast, SDO is the result of perceiving the world as a ‘competitive jungle’. In other words, believing that there is competitiveness over group dominance, power and resources (Duckitt & Sibley, 2009). These perceptions originate from a combination of ‘toughmindedness’, a personality dimension that corresponds with low agreeableness and lack of empathy (Goertzel, 1987), and socialization in an environment characterized by ingroup dominance, inequality and competition (Duckitt & Sibley, 2009). As posited in the DPM framework (Duckitt, 2001), ideology also leads people higher on RWA and SDO to be sensitive to particular types of threat. People higher on RWA are more sensitive to social threats and those higher on SDO are more sensitive to challenges to group dominance (Duckitt, 2001; Duckitt & Sibley, 2009). The relation between ideology and threat perceptions outlined in the DPM is discussed in the next section.

### **Threat**

Threat has long been a concept explored as underlying prejudice (e.g. Allport, 1954). For instance, competitive threats were explored by Sherif (1966), who noted that intergroup competition for resources can lead to perceiving the outgroup as threatening. Subsequent research has shown that competition and the threat of competition between lower status and

higher status groups increases hostility, antagonism, and the need and motivation for discrimination (Blalock, 1967; Bonacich, 1972, as cited in Semyonov, Rajzman, Tov, & Schmidt 2004). Two of the most widely applied and cited theories that connect threat to prejudice are the Dual Process Model (Duckitt, 2001) and Intergroup Threat Theory (Stephan & Stephan, 2000).

### **Dual Process Model and Threat**

As noted above, the role of threat is central to the DPM (Duckitt, 2001; Duckitt & Sibley, 2009). Duckitt (2001) argued that RWA and SDO predict political and intergroup outcomes via threat perceptions. Specifically, the effects of RWA are proposed to be mediated by perceived social threat and its management. It is posited that individuals higher in RWA will dislike outgroups whom they perceive as socially threatening (i.e. groups that violate traditional norms and values). They are also expected to be more likely to support political parties and policies that aim to control and manage perceived social threats (Duckitt & Sibley, 2009). The effects of SDO on outcomes such as outgroup aversion are predicted to be mediated by intergroup competitiveness for power, resources and establishing group dominance, and intergroup inequality (Duckitt, 2001; Duckitt & Sibley, 2009). Further, political party or policy support for individuals higher in SDO are proposed to be mediated by perceptions of the commitment of these parties or policies to establish or maintain ingroup dominance and inequality. According to the DPM, people higher in SDO are more sensitive to low status outgroups that challenge the high status group's superiority and compete for shared resources (e.g. immigrants). Therefore, RWA and SDO are both theorized to predict prejudice, but via distinct pathways.

There is empirical support for the differential mediation hypothesis. As one example, Duckitt (2006) found that the effects of RWA on hostility towards socially deviant groups (such as drug dealers) were mediated by perceived social threat from these groups, and not by

competitiveness. In contrast, the significant effects of SDO on aversion to socially subordinate or low status groups (such as housewives and unemployment beneficiaries) were mediated by competitiveness for establishing group dominance. Similarly, McFarland (2005) found that RWA and SDO predicted support for the US attack on Iraq in 2003, with the relations being mediated by unique threats. For individuals higher on RWA, support was explained by the perception that Iraq threatened America whereas for people higher on SDO, reduced concern for the likely human toll of the war explained support for the attack. Thus, the same outcome is accounted for by different threat mechanisms. In the present thesis, I explored whether prejudice towards vegans and Sikh vegans or vegetarians by people high on RWA or SDO could be explained by social threat and group dominance threat perceptions, respectively.

### **Intergroup Threat Theory**

In their Intergroup Threat Theory, Stephan and Stephan (2000) outline four types of threats that may lead to negative intergroup outcomes: realistic threat, symbolic threat, negative stereotypes and intergroup anxiety. Realistic threats pose a danger to the ingroup in terms of physical threats and threats to political, economic and social power and hegemony (Bobo, 1998, as cited in Riek, Mania, & Gaertner, 2006; Stephan & Stephan, 2000). Realistic threats were first proposed by Sherif and Sherif (1969) in their Realistic Group Conflict Theory (RGCT). According to this theory, when two groups are in competition for scarce resources (such as money), people tend to believe that the potential success of one group threatens the well-being of the other. This, in turn leads to negative outgroup attitudes. The role of realistic threat in the relation between conflict and intergroup bias has been demonstrated across a variety of situations where one group threatens the interest of another group (Sherif et al., 1961), including anti-immigrant prejudice in resident groups (Esses, Jackson, & Armstrong, 1998).

Although RGCT explains how conflict over resources can lead to perceptions of threat, it does not address existence of intergroup bias in the absence of such conflict. The construct of symbolic threat was posited to explain bias in such contexts (Riek et al., 2006; Sears, 1988). Symbolic threats include perceived differences in group morals, beliefs and attitudes; they are threats to a group's worldview, and may arise because an ingroup believes in the 'moral rightness' of their values (Stephan & Stephan, 1996, 2000). The idea of symbolic threat originates from the symbolic racism theory (Kinder & Sears, 1981). According to this theory, racial bias towards Blacks was not due to their perceived biological inferiority anymore, but due to beliefs that they violate and threaten values important to Whites (Kinder & Sears, 1981). The relation between symbolic threat and intergroup bias has been observed in other intergroup settings, such as anti-immigrant bias in Americans (McLaren, 2003; Riek et al., 2006).

In their ITT, Stephan and Stephan (1996, 2000) posited that negative stereotypes and intergroup anxiety can also be considered unique types of intergroup threats as they reflect concerns regarding negative outcomes from intergroup interactions (see Riek et al., 2006). Negative stereotypes represent negative expectations about outgroups (including their behaviour) and influence social information processing and social judgements (Ybarra, Schaberg, & Keiper, 1999). This fear of negative consequences is a main component of this category of intergroup threat (Stephan & Stephan, 1996; Riek et al., 2006). Empirical evidence shows that negative stereotypes predict prejudiced intergroup attitudes (e.g. Spencer, Rodgers, & McGovern, 2002). Some research also indicates that in addition to independently and directly predicting prejudice,

negative stereotypes might also predict realistic threat, symbolic threat, and intergroup anxiety (Stephan & Renfro, 2002).

Finally, intergroup anxiety is a type of uneasiness or distress that individuals experience when anticipating or engaging in intergroup interaction (Stephan, 2014). It is confined to the intergroup context and not as broad as social anxiety. Intergroup anxiety may be elicited only by specific outgroups or outgroups in general (Paolini, Hewstone, Voci, Harwood, & Cairns, 2006). It has been theorized as having three components (affective, cognitive and physiological). The affective one is considered the central component of this threat and entails negative and aversive emotions in response to intergroup contact (Stephan, 2014). Intergroup anxiety is associated with avoiding outgroup members (Cole & Yip, 2008), not being open with outgroup members, and offensive behavioural tendencies towards outgroups (see Stephan, 2014; van Zomeren, Fischer, & Spears, 2007). These include discrimination against and lower willingness to assist immigrants (Costello & Hodson, 2011). Intergroup anxiety has been proposed as a mediator between personality traits and negative behaviours towards outgroups such as prejudice, discrimination and avoidance (Stephan, 2014).

Riek and their colleagues (2006) conducted a meta-analysis with 95 separate samples, to assess whether different types of intergroup threats - realistic threat, symbolic threat, negative stereotypes, intergroup anxiety and group esteem threat - were associated with outgroup attitudes. Consistent with the ITT, realistic threat, symbolic threat, negative stereotypes, and intergroup anxiety all uniquely and significantly predicted outgroup attitudes (Riek et al., 2006). Further, these threat types accounted for 36% of the variance in outgroup attitudes. Research has also identified general precursors to intergroup threats, including high levels of negative

intergroup contact and high degree of ingroup identification (Stephan et al., 2000 as cited in Riek et al., 2006; Pettigrew & Tropp, 2008).

Of interest in the present thesis, RWA and SDO have been linked with the affective component of intergroup anxiety (Stephan, 2014). For example, Costello and Hodson (2011) found that people higher on SDO were less likely to help immigrants, and this relation was mediated by intergroup anxiety. Research also indicates that intergroup anxiety towards groups perceived as threatening is associated with RWA. Blair, Park and Bachelor (2003) found that heterosexual participants higher on RWA experienced more intergroup anxiety when imagining contact with a same-sex gay target, than with a heterosexual target. Additionally, it has been suggested that intergroup anxiety associated with RWA would be more likely to lead to hostile or punitive behavioural responses towards outgroups than if it was caused by non-ideological traits (Stephan, 2014). In the present thesis, all four ITT threats (negative stereotypes, realistic threat, symbolic threat and intergroup anxiety) were explored as possible mediators of the relation between ideology (RWA and SDO) and prejudice towards single outgroups (vegans) and double outgroups (Sikhs who are vegetarian or vegan).

### **Prejudice Toward Vegans and Vegetarians**

There is a limited number of published studies on negative attitudes towards vegans and vegetarians (for some exceptions see Earle & Hodson, 2017; Judge & Wilson, 2018; MacInnis & Hodson, 2017; Minson & Monin, 2012; Minson & Norton, 2003). The research conducted so far suggests that vegans and vegetarians are evaluated negatively. For example, Minson and Norton (2003) found that vegetarians were rated lower on the potency factor relative to meat eaters. The potency factor represents a recurring pattern of attitudes used by individuals to evaluate other people as ‘strong’ or ‘weak’, with the former considered a positive trait, and the latter a negative

trait (Osgood, Suci, & Tannebaum, 1957). In another study (Minson & Monin, 2012), 47% of an omnivore sample associated negative terms with vegetarians, with most of the associations generated being negative social characteristics such as self-righteous or annoying. Minson and Monin (2012) also found support for a positive relation between meat eating and prejudice towards vegetarians. Similarly, MacInnis and Hodson (2017) found that participants rated vegans and vegetarians lower on attitude thermometers than Blacks, and equivalent to atheists, immigrants and asexual individuals. Importantly, social desirability may, in part, account for this pattern of ratings. Finally, of the groups examined in this research (MacInnis & Hodson, 2017) participants had more negative attitudes only towards drug addicts.

MacInnis and Hodson (2017) also carried out a content analysis of stereotypes of vegans and vegetarians. They discovered that vegans and vegetarians were perceived as relatively lower on warmth and higher on competence. Hence, vegetarians and vegans may be targets of envious prejudice, similar to what is faced by Asian Americans and highly educated people (Fiske, Cuddy, Glick, & Xu, 2002). MacInnis and Hodson (2017) suggested that this prejudice may arise from the perception of vegans/vegetarians as doing the ‘right thing’ by minimizing animal exploitation, but exhibiting a degree of restraint or discipline that many omnivores may not be willing to attempt.

MacInnis and Hodson (2017) also asked vegans and vegetarians about their experiences of bias and discrimination. Twenty-five percent reported that their friends had decreased contact with them after finding out about their dietary choices. Forty-three percent of vegetarians and almost 67% of vegans reported facing low intensity, minor discrimination on a regular basis (measured by a 10-point everyday discrimination rating scale). Additionally, more vegans than vegetarians, and more males than females (across vegans and vegetarians) reported not being

hired or promoted due to their group membership or lifestyle. These findings indicate that individuals who are vegan or vegetarian are evaluated more negatively and receive negative treatment linked with their dietary choices.

Several theories have been put forth to explain this diet-based prejudice. According to the communal food hypothesis (see Bresnahan, Zhuang, & Zhu, 2016), eating together in social gatherings fosters fellowship and warmth. Rejecting the food offered on such an occasion, as a vegan would in a gathering of non-vegans eating meat dishes, can be perceived as a rejection of the fellowship. Even if the vegan or vegetarian does not say anything negative, their presence on the table might be considered as an obstacle to the spirit of warmth and comradery (Twine, 2014). Bresnahan et al. (2016), however, did not find empirical support for the influence of food communality on stigma against vegans. Participants experimentally assigned to read an anti-vegan message, were not more supportive of food communality than those in pro-vegan and control conditions.

Cognitive dissonance could be a potential explanation for prejudice towards vegans and vegetarians. Research indicates that it serves as a mechanism for denial of mind to animals, and for protecting cultural practices such as meat eating (Bastian, Loughnan, Haslam, & Radke, 2012; Haslam & Bastian, 2010). In the context of meat-eating and animal perception, cognitive dissonance represents an ambivalent and unpleasant affective state that arises from inconsistencies in people's beliefs ("I love animals"), and conventional dietary choices and lifestyle (Bastian et al., 2012). Consistent with a cognitive dissonance explanation, Haslam and Bastian (2010) found that participants given beef to eat, reported a lower moral concern for animals than those given cashews. Levels of moral concern also mediated perceptions of animals' mental capacities, with individuals in the beef condition rating animals relatively lower



on their capacity to suffer. Research by Bastian et al. (2012) further revealed that when people were reminded of the link between meat and animal suffering with graphic words such as ‘butchered’ and ‘killed’, they were much more likely to deny animal suffering and other mental capacities, than if they were told to think about the use of animals in food production without graphic descriptions (Bastian et al., 2012). These studies suggest that expecting to or actually consuming meat (Haslam & Bastian, 2010), and graphic descriptions of animal slaughter (Bastian et al., 2012) may induce cognitive dissonance. In turn this can lead to attributing a lower mental capacity of suffering to animals in order to justify meat consumption.

Prejudice toward vegans and vegetarians has also been connected to vegetarianism/veganism threat – i.e. threat that entails a perception that social and cultural norms regarding diet and lifestyle, such as meat eating, are being threatened (see Dhont & Hodson, 2014). MacInnis and Hodson (2017) found that perceived vegan/vegetarian threat partially explains prejudice towards vegans and vegetarians. Further, participants who perceived a vegetarianism/vegan threat were more likely to avoid contact with the outgroup and be less open to relationships with them. MacInnis and Hodson (2017) also explored whether reasons for dietary-choice impacted the level of prejudice. They found that vegetarians and vegans who adopted these lifestyles for animal welfare reasons were evaluated most negatively, followed by those who did it for environmental reasons, then religious and health reasons, respectively.

Also exploring the role of threat, Minson and Monin (2012) examined moral reproach. Moral reproach refers to the threat of being morally judged and then evaluated negatively. Minson and Monin (2012) measured participants’ perceptions of how they would expect vegetarians to morally judge them. It was found that omnivores anticipated being evaluated negatively by vegetarians. In response to these aversive anticipations (moral reproach), omnivore

participants were more likely to derogate vegetarians as a group. Further, the more vegetarians were expected to demonstrate moral superiority, the more negative word associations were generated for them by participants (Minson & Monin, 2012).

Some research has also examined the role of ideology. People subscribing to right-wing ideologies (RWA and SDO) have a higher tendency to consume meat and consider animal exploitation acceptable (Dhont & Hodson, 2014). This relation is mediated by vegetarianism threat. For those higher in SDO, this relation is also explained by a belief in human superiority over animals (Dhont & Hodson, 2014). Further, people higher on RWA and SDO are more prejudiced towards vegans and vegetarians, more likely to discriminate against vegans and vegetarians across various contexts like hiring employees and renting to tenants, and more likely to avoid interacting with them (MacInnis & Hodson, 2017). These associations are at least partially explained by vegetarianism/vegan threat perceptions. Therefore, there is emerging research showing that prejudice toward vegans and vegetarians, may be, at least in part, connected to right-wing ideology and threat perceptions.

### **Prejudice Towards Sikhs**

As noted above, vegans and vegetarians who adopted the lifestyle for religious reasons were evaluated less negatively than individuals who did it for animal welfare and environmental reasons (MacInnis & Hodson, 2017). Although religious beliefs appear to have a buffering effect in this context, other research has found that members of religious minorities are often the targets of prejudice and discrimination (Zafar & Ross, 2015). The present research focused on attitudes

toward Sikhs, given the vegetarian preferences of some subsets of the Sikh faith (Srivastava, 2007).

Negative perceptions of Sikhs in an intergroup context are documented. Kalin and Berry (1995) found that Sikhs were rated the lowest on a preference hierarchy of social groups, by a predominantly British/French-Canadian sample of participants. South Asian participants (including Sikhs) received negative ratings even from groups they had rated positively. Similarly, Zafar and Ross (2015) showed that a sample of primarily Christian Canadians evaluated Sikhs and Muslims most negatively. In an open-ended description task, some of the most frequently reported emotions towards Sikhs were of a negative valence, such as bad, scared and uncomfortable. Using an American sample, Raj, Schmidtke, Cummings, and Moore (2008) found that participants held much more negative views towards Sikhs than for old people. In terms of their stereotype content, Sikhs were considered cold and competent, whereas old people were rated as warm and incompetent. Raj and their colleagues (2008) posited that as most Sikhs have South Asian ancestry, they may be viewed as an outgroup along racial lines (surface characteristics) as well as religious lines (deeper characteristics).

### **Double Outgroup Membership and Multiple Social Identities**

Sikhs who are vegan or vegetarian can be described as double outgroups. According to the double jeopardy hypothesis (Dowd & Bengston, 1978), members of double outgroups may be judged more negatively than members of single outgroups. On the other hand, in the “intersectionality invisibility” theory, Purdie-Vaughns and Eibach (2008) argue that depending on the context, people belonging to multiple sub-ordinate groups (including double outgroups) may be subject to more or less prejudice than those from single sub-ordinate groups. People from the former category could be seen as less prototypical of their ingroups, and hence less likely to

be targets of explicit prejudice and discrimination, than people belonging to multiple subordinate groups. However, lower prototypicality could relate to such individuals being ignored or marginalized in other contexts, with their opinions and experience not considered representative of any of their ingroups.

According to the motivated tactician model of social cognition, social perceivers are fully engaged thinkers whose cognitive processes may be guided by their goals, motives, and needs (see Fiske & Taylor, 2008). Consistent with this model is the notion that everyone can be potentially categorized into multiple categories, and in some circumstances people will activate multiple social categories during social judgements of targets (see Crisp & Hewstone, 2007). Bodenhausen (2010) identified three models of multiple category management from the perceiver's perspective. These include dominance (only one social category affects how a target is evaluated), compartmentalization (context of the situation dictates which category of a target's identity will be salient and the individual will be perceived), and integration (a target's multiple social categories are simultaneously observed and combined in some form by perceivers).

Multiple categorization that follows the integration model is usually researched using a paradigm known as crossed categorization (Breen, 2010). In this paradigm, two categories of a target's identity are salient. For instance, rather than individuals being perceived as only high caste or Hindu, perceivers would attend to both dimensions simultaneously (Urban & Miller, 1998). Some research using this paradigm supports the notion that categorization of targets as double outgroups may lead them to have different outcomes than single outgroups (Crisp & Hewstone, 2007). For instance, White participants evaluating hiring practices and job training as part of a survey study were more strongly opposed to affirmative action for Black women than for Black men (Steinbugler, Press, & Dias, 2006). In another study, White University students

evaluated Blacks who shared University affiliation less negatively than Blacks who did not share this affiliation (Hehman, Stanley, Gaertner, & Simons 2011). Therefore, perceivers have more negative attitudes towards individuals who are part of double outgroups compared to single outgroups. In the latter case, partial ingroup membership may provide targets with a partial buffer from prejudice (Hehman et al., 2011).

Based on the postulates of the double jeopardy hypothesis (Dowd & Bengston, 1978), and the findings of the research documenting double discrimination (e.g. Hehman et al., 2011), it could be presumed that Sikhs who are vegetarian or vegan may be subject to more prejudice than targets who are either only vegan/vegetarian or only Sikh. However, as noted earlier, it has been argued that single outgroups may be subject to more prejudice than double outgroups in some contexts (Purdie-Vaughns & Eibach, 2008). And specific research on vegans also shows that being vegan or vegetarian for religious reasons may have a buffering effect on dietary-based prejudice (MacInnis & Hodson, 2017). Therefore, it was unclear how people will respond to people who are religious and dietary minorities. One goal of the present thesis was to clarify this discrepancy.

### **Imagined Contact and Intergroup Attitudes**

A secondary goal of the present thesis was to investigate whether imagined contact (Crisp & Turner, 2009) led to positive attitudes towards dietary outgroups like vegans. Imagined contact interventions are theoretically derived from the contact hypothesis. According to Allport's (1954) contact hypothesis, intergroup contact can foster tolerance. Allport believed that these positive effects of intergroup contact are much more likely to occur in situations where four facilitating conditions are present: equal group status within the situation; common goals; intergroup cooperation; and the support of authorities, law, or custom.

Summarising decades of research on the contact hypothesis, Pettigrew and Tropp (2006) conducted a meta-analysis with 713 independent samples. Their analysis revealed that intergroup contact is associated with lower prejudice. Samples that had two or more of Allport's (1954) facilitating conditions, or just the sanction of authority condition, showed a significantly stronger prejudice reduction effect of contact than other samples. This meta-analysis also revealed that contact effects usually generalize to the entire outgroup, and are not limited to the specific outgroup members an individual is in contact with. Additionally, it was found that intergroup contact is useful in reducing prejudice across a range of outgroup targets and contact settings, not just for racial and ethnic contexts. Intergroup contact works through different cognitive and affective processes such as reduction of anxiety and increased trust to reduce prejudice and improve intergroup relations (Hodson & Hewstone, 2013).

Allport's (1954) contact hypothesis primarily focuses on face-to-face or direct contact. Face to face intergroup contact is not always possible due to physical and psychological barriers. As a result, researchers have explored other types of contact. According to the extended contact hypothesis (Wright, Aron, McLaughlin-Volpe, & Ropp, 1997), vicarious contact can have similar benefits to direct contact, such as learning that people we know have had positive intergroup interactions with members of an outgroup. Research has demonstrated the effectiveness of extended contact (e.g. Turner, Hewstone, & Voci, 2007; Gómez, Tropp, & Fernandez, 2011). One form of extended contact that shows promise for reducing prejudice is imagined contact (Crisp & Turner, 2009).

Imagined contact involves mental simulation of social interactions with outgroup members (Crisp & Turner, 2009). Mentally simulating a positive contact experience is thought to activate concepts that are usually related to successful interaction with members of other groups

(Turner, Crisp, & Lambert, 2007). In imagined contact, individuals may utilize conscious processes that parallel ones used in direct contact, such as thinking about how interacting with someone from another group will make them feel (Garcia et al., 2002, as cited in Crisp & Turner, 2009). Imagined contact can lead people to feel more comfortable and less worried or fearful about future contact with the outgroup (Crisp & Turner, 2009). Imagined contact has been associated with lower intergroup prejudice and more positive perceptions of intergroup relationships (Crisp & Turner, 2009; Turner et al., 2007).

Miles and Crisp's (2014) meta-analysis reviewed over 70 studies that examined the role of imagined contact in reducing prejudice and intergroup bias. This meta-analysis reported that imagined contact was significantly associated with more positive intergroup attitudes and behavioural intentions, compared to control conditions. In the imagined contact conditions, a reliable small-to-medium effect was observed across all measures of intergroup bias ( $d = .30$  to  $.46$ ). The beneficial effects of lower intergroup anxiety and prejudice were observed in both positive and neutral imagined contact conditions (Miles & Crisp, 2014). On the other hand, past research shows that negative imagined contact actually increases intergroup biases and may be ineffective for prejudice reduction (Crisp & Turner, 2009).

A specific type of imagined contact, elaborated imagined contact (EIC) also leads to more positive intergroup outcomes and positive behavioural intentions, as well as lower intergroup anxiety, than no contact (see Miles & Crisp, 2014). This imagined contact paradigm includes detailed instructions and the use of a behavioural script. Participants think about exactly when and where the contact with members from another group will take place. This intervention has been found to relate to greater tolerance and lower intergroup anxiety than regular imagined contact (Husnu & Crisp, 2010).

Imagined contact, including EIC has also been shown to decrease prejudice towards religious and racial outgroups. Choma, Charlesford, and Hodson (2014) found that White British participants who were administered an EIC intervention with an Algerian Muslim confederate, reported reduced prejudice towards Algerian Muslims after the EIC session. On the other hand, participants administered a physical contact intervention instead of the EIC in the first session, did not experience reduction in prejudice towards Algerian Muslims. Research by Stathi and Crisp (2008), with a Mexican sample, found that Mestizos had more positive perceptions of and projected more positive traits towards Indigenous people (ethnic outgroup) after imagining contact with them in a positive context.

There is very little research on prejudice reduction for diet-based outgroups, particularly vegans and vegetarians in an imagined contact context. This outgroup is novel compared to ethnicity, race or even religion. Anecdotally, adults are much more likely to choose an unconventional diet and lifestyle (e.g. veganism or vegetarianism) than choose their religion. Other social categories such as ethnicity and race are fixed. Past research suggests that the benefits of both positive direct contact and imagined contact extend to outgroup types beyond race and ethnicity (Miles & Crisp, 2014; see Pettigrew & Tropp, 2006). This possibility was examined in the present thesis by exploring the effects of an imagined contact intervention on negative attitudes towards vegans (outgroups based on diet/lifestyle).



## Study 1

### Hypotheses

Study 1 investigated the role of religion, ideology, and threat in understanding diet-based prejudice. Consistent with the ‘double jeopardy hypothesis’ (Dowd & Bengtson, 1978), it was predicted that prejudice toward vegans/vegetarian Sikhs as a *group* would be higher than any other groups, in general (Hypothesis 1a). Further, I predicted that a target’s religious and diet-based identities would interact to influence their ratings, with the *target individual* rated less positively when they were a vegan/vegetarian Sikh, than any other combination of dietary and religious affiliation (Hypothesis 1b).

Given that right-wing ideologies consistently predict higher prejudice (Altemeyer, 1981; Pratto et al., 1994), I expected that people higher (vs. lower) on RWA or SDO would be more prejudiced towards vegans and Sikh vegans/vegetarians (Hypothesis 2). Lastly, drawing from the DPM (Duckitt, 2001; Duckitt & Sibley, 2009), ITT (Stephan & Stephan, 1996, 2000), and previous findings (Dhont & Hodson, 2014), it was predicted that the relationship between ideology and prejudice towards vegans and Sikh vegans/vegetarians would be mediated by threat perceptions (Hypothesis 3). Mediation models based on the DPM (Duckitt, 2001; Duckitt & Sibley, 2009), the ITT (Stephan & Stephan, 1996, 2000) and veganism/vegetarianism threat models (MacInnis & Hodson, 2017) were evaluated. More specifically, for the DPM model, social threat and group dominance threat were tested as mediators (Hypothesis 3a); for the ITT model, realistic threat, symbolic threat, intergroup anxiety, and negative stereotypes, were tested as mediators (Hypothesis 3b); and for the Veganism/Vegetarianism Threat model, veganism threat was tested as a mediator (Hypothesis 3c). Given the conceptual overlap among the models,

a general threat mediation model, that tested the mediating effect of all threat types on the relationship between ideology and prejudice, was also evaluated (Hypothesis 3d).

## **Method**

**Participants and procedures.** A power analysis using G\*Power with seven predictors (for regression analyses) and an expected medium effect size (based on findings of Kalin & Berry, 1995; MacInnis & Hodson, 2017), recommended a minimum sample size of 153 participants. Therefore, 406 first year undergraduate students from Ryerson University were recruited ( $M_{age} = 19.63$ ,  $SD = 4.08$ ; Gender: Male 15.5%, Female 83.7%; Ethnicity: White/Caucasian 30.0%, Filipino 10.8%, South Asian 14.5%, Southeast Asian 3.7%, Latin American 1.2%, Chinese 11.1%, Arab/West Asian 5.9%, Black 8.9%, Japanese 0.2%, Korean 2.0%, Other 11.6%; Religious Affiliation: Buddhist 5.0%, Hindu 5.3%, Christian 41.3%, Muslim 13.3%, Sikh 1.5%, Jewish 2.5%, Atheist 14.5%, Other 16.8%; Diet: Vegetarian 8.0%, Omnivore 89.6%, Vegan 2.5%). To control for ingroup biases, data from 47 participants who were Sikh and/or vegan/vegetarian, was excluded.

Participants were recruited from the SONA participant pool and given course credit in exchange of their participation. The study was conducted online, using Qualtrics. After consenting, participants first completed measures of RWA and SDO, and then were randomly assigned to one of four conditions that manipulated a target's religious affiliation (Sikh *vs.* Christian) and diet (vegan/vegetarian and omnivorous). All participants read a passage about an individual who had multiple salient social identities (religious affiliation and diet). These passages described the target in a few sentences, focusing on mundane things like their favourite sports teams, social life etc. The content of these passages was kept as neutral as possible (not significantly stereotypical or counter stereotypical). This was because previous research suggests

that exposure to counter stereotypical information about members of a target outgroup can reduce prejudice towards them (Blair, Ma & Lenton, 2001), with stereotypical information having the opposite effect (see Blair, 2002). The experimental manipulation passage varied based on the group assigned to participants, but followed the same general format:

“J.S. works and lives in Toronto. He grew up in Toronto and as a kid played mostly with other Sikh/Christian friends. After finishing University, he moved closer to downtown Toronto where he got a job. On weekends, he really enjoys going out with his friends. He loves going to Blue Jays games. Before seeing a Blue Jays game, J.S. and his friends often head out for a bite to eat. J.S. is vegan/vegetarian/an omnivore. He and his friends often go to a restaurant that has a wide variety of choices. J.S. also loves going to Blue Mountain in the winter for skiing.”

After reading the experimental manipulation paragraphs, measures of prejudice toward the target and religious and diet-based outgroups (i.e. Sikhs, vegans, and Sikh vegans/vegetarians) were administered. An open-ended outgroup description task was used to record participants’ qualitative descriptions of outgroups (Esses et al., 1993). Additionally, another open-ended item was administered to ask participants their opinions about vegans and vegetarians<sup>1</sup>. Measures of threat were also administered. Finally, participants read a debriefing form explaining the specific purpose of the study.

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<sup>1</sup> The open-ended description task about outgroups and the item assessing participants’ opinions on vegans and vegetarians were not analysed for this thesis.

## Measures

**Demographic information.** Age, gender, education, country of residence, ethnicity, dietary preferences, and religious affiliation were measured (see Appendix A).

**RWA.** Participants completed the 22-item version of the RWA scale (Altemeyer, 2006). This measure is an updated version of Altemeyer's (1988) original scale (see Appendix B). Participants indicated the degree to which they agree with each statement (e.g., "The established authorities generally turn out to be right about things, while radicals and protestors are usually just 'loud mouths' showing off their ignorance") on a scale from -4 (Very Strongly Disagree) to +4 (Very Strongly Agree). Scores were created by averaging the items, after reverse scoring appropriate items. Higher scores indicated greater levels of RWA ( $\alpha = .89$ ).

**SDO.** This 16-item SDO<sub>7</sub> scale (Ho et al., 2015; see Appendix C) was administered, using a 7-point rating scale, ranging from 1 (Strongly Oppose) to 7 (Strongly Favour). Some items on this scale include: "Some groups of people must be kept in their place," and "It's probably a good thing that certain groups are at the top and other groups are at the bottom." Ratings were averaged after reverse-scoring appropriate items with higher scores indicating higher levels of SDO ( $\alpha = .86$ ). Like earlier versions of the SDO scale, the SDO<sub>7</sub> scale has also shown high reliability and validity (Ho et al., 2015).

**Intergroup anxiety scale.** A modified intergroup anxiety scale (see Appendix D) derived from the intergroup anxiety scale by Stephan and Stephan (1985), was used. The measure consists of 10 items that ask participants how they would feel when interacting with members of an outgroup. Participants in each condition were asked about their level of comfort while interacting with the group specific to their condition (i.e. Sikh vegans/vegetarians, Sikh omnivores, Christian vegans/vegetarians, Christian omnivores). The response format for these

items was a 7-point scale ranging from 1 (not at all) to 7 (extremely). Appropriate items were reverse scored. Items were averaged for determining average scores, with higher scores implying greater intergroup anxiety ( $\alpha = .88$ ).

**Realistic threat.** Participants completed a modified three-item version of the realistic threat scale (Stephan & Stephan, 2000; Stephan et al., 1999), adapted to assess the perceived realistic threat posed by any of the four groups based on various combinations of diet and religious affiliation (see Appendix E). The question stems were identical across groups, but participants were asked about the realistic threat from the group specific to their condition. Participants indicated the degree to which they agreed with each item on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree). After reverse scoring appropriate items, all items were averaged to create an overall score of perceived realistic threat ( $\alpha = .91$ ). Higher scores indicate greater perceived realistic threat.

**Symbolic threat.** Participants completed a modified two-item version of the symbolic threat scale used by Brandt, Chambers, Crawford, Wetherell and Reyna (2015), adapted to assess the perceived symbolic threat (see Appendix F). The question stems were identical across groups, but participants were asked about the symbolic threat from the group specific to their condition. Participants indicated the extent to which they considered a statement to be true, with each statement on the scale ranging from 1 (Not at All) to 7 (To a Great Extent). Scores were created by averaging the items, and higher scores indicated greater perceived symbolic threat ( $\alpha = .71$ ).

**Vegetarianism/veganism threat.** Eight items from Dhont and Hodson's (2014) Vegetarianism Threat Scale (see Appendix G) were adapted to measure perceptions of threat from both vegetarianism and veganism. Participants indicated the degree to which they agreed

with each statement (e.g., “Vegetarians/vegans think they are better than meat eaters”) on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree). Appropriate items were reverse scored. Scores were created by averaging the items, and higher scores indicated greater perceived vegetarianism/veganism threat ( $\alpha = .89$ ).

**Negative stereotypes.** Participants used a modified version of a negative stereotypes measure (Stephan & Stephan, 2000; Stephan et al., 1999). As part of this measure (see Appendix H), an 11-point ratings scale first provided estimates of the percentage of the group assigned to participants, that participants believed possessed each of the 14 traits on the scale. The percentages were assessed in 10% increments, ranging from 1(0%) to 11(100%). Further, participants were also asked to rate the favourability of various traits on a different scale from 1 (Very favourable) to 10 (Very unfavourable). Out of the 14 traits, nine were identified as having a negative valence. Scores were created by multiplying each of these nine trait’s favourability rating and estimated percentage prevalence and then adding the products of all traits together. This sum of products was then averaged to create an average stereotype index ( $\alpha = .74$ ). The traits used in this measure were identical for all groups. Some of the traits were determined by previous research on stereotypes of vegans and vegetarians (MacInnis & Hodson, 2017; Minson & Monin, 2012). Higher scores on the stereotype index indicated more negative stereotypes.

**Group Dominance Threat.** Participants completed a four-item modified version of a group dominance threat scale (Charlesford & Choma, 2013; Choma, Haji, Hodson & Hofarth, 2016). The question stems were identical across groups, but participants were asked about the group dominance threat from the group specific to their condition. Participants indicated the degree to which they agreed with each statement on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree). For this measure (see Appendix I), appropriate items were reverse-scored.

Scores were then created by averaging all items, and higher scores indicated greater perceived group dominance threat ( $\alpha = .48$ ). A Cronbach's alpha value of  $\alpha < .70$  indicates that the scale had a low degree of internal consistency.

**Social Threat.** Participants completed a four-item modified version of a social threat scale (Charlesford & Choma, 2013; Choma et al., 2016). The question stems were identical across groups, but participants were asked about the social threat from the group specific to their condition. Participants indicated the degree to which they agreed with each statement on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree). For this measure (see Appendix J), appropriate items were reverse-scored. Scores were then created by averaging the items, and higher scores signified greater perceived social threat ( $\alpha = .71$ ).

**Attitude Thermometers.** Participants filled out attitude thermometers that have been widely used in survey research (e.g. in Haddock, Zanna, & Esses, 1993; MacInnis & Hodson, 2017, see Appendix K) in which they rated various groups (such as Sikhs, Christians, vegans and omnivores) on a scale ranging from 1 (extremely unfavourable) to 100 (extremely favourable). The assigned target individual ("J.S.") was also rated using these thermometers. The scale had intervals of 10. For this scale, higher scores indicated more positive attitudes towards the groups or target individual.

**Open-ended response task.** A descriptive task (see Appendix L) was used to assess participants' beliefs about and emotions experiences when thinking about the target group assigned to them (Esses et al., 1993). Participants were asked to list up to 10 emotions they experience when thinking about any of the six groups based on various combinations of diet and religious affiliation. They were also asked to list up to 10 characteristics they think the members

of these target groups exhibit. As noted above, this measure was not analysed in the present thesis.

**Opinion on vegans and vegetarians.** In this open-ended question, participants were asked about their experiences with vegans and vegetarians, and their opinions or thoughts on the target group (see Appendix M). As noted earlier, this measure was not analysed in the present thesis.

### **Data Analysis**

Data was analyzed using SPSS and AMOS. The independent variables assessed were manipulated target religious affiliation (Sikh vs. Christian), manipulated target diet (vegan vs. omnivore), and measured ideology (RWA, SDO). Threat perceptions were the mediators. The dependent variables assessed were the attitudes towards the target and the various social groups, including the double outgroup of Sikhs who are also vegan or vegetarian. I carried out list-wise analyses for this study, and data from 32 participants was excluded. Specifically, data from 10 participants was deleted as they did not respond to any items other than providing their content to participate. Twenty-two unique participants did not respond to any items for one or more of the following variables: RWA (n=1), SDO (n=2), Intergroup Anxiety (n=2), Symbolic Threat (n=3), Stereotype Threat (n=6), Group Dominance Threat (n=5), Social Threat (n=6), Veganism Threat (n=7), JS ratings (n=1), Vegan ratings (n=1), and Sikh vegan/vegetarian ratings (n=5). For these participants, the mean scores for one or more of the above mentioned variables were not computed. Consequently, data for these 22 participants was excluded from the list-wise analyses.

### **Results**

**Descriptive analyses and normality of IVs and DVs.** Descriptive analyses were carried out on all the IVs and DVs. Means, standard deviations, skewness and kurtosis statistics for Study 1 variables are shown in Table 1.1, and correlations among Study 1 variables are displayed



in Table 1.2. Examination of skewness and kurtosis values, and histograms of each variable revealed that some variables were not normally distributed. The attitude ratings variables (the ratings of JS, vegans and Sikh vegetarian/vegans) were negatively skewed, such that most participants reported favourable attitudes towards the target groups. Realistic threat, symbolic threat and negative stereotypes<sup>2</sup> showed positive skews, such that participants tended to report low levels of threat. For realistic threat, 30% of the participants selected a “1”, which was the lowest score for that scale. This contributed to the highly skewed distribution. The social threat variable had a non-normal distribution as well, with relatively higher frequencies of lower and higher values. Given these issues with non-normality, bootstrapping was performed using 1000 samples. However, due to the extreme non-normal nature of realistic threat, this variable was excluded from further analysis.

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<sup>2</sup> For negative stereotypes there was an extreme outlier with a value of “110”. Winsorizing was conducted and all instances of that value were replaced with the next highest score, “82.17”. The descriptives for negative stereotypes are based on the adjusted distribution. Same for any other analyses that included this variable.

Table 1.1

*Means, standard deviations, skewness, kurtosis, minimum and maximum values of Study 1 variables*

	<i>M</i>	<i>SD</i>	Min	Max	Skewness	Kurtosis
RWA	3.36	1.12	1.1	7.2	0.21	-0.33
SDO	2.45	0.82	1	4.81	0.19	-0.44
Realistic Threat	2.54	1.53	1	7	0.76	-0.34
Symbolic Threat	3.37	0.87	1	6.25	0.42	0
Negative stereotypes	17.9	15.11	1	110	1.89	5.65
Intergroup Anxiety	2.96	1.11	1	5.5	0.07	-1.08
Veganism Threat	2.35	0.74	1	4.36	0.21	-0.73
Group Dominance Threat	3.52	0.94	1	6.25	-0.21	0.1
Social Threat	2.45	0.99	1	5.25	0.31	-0.71
JS	76.42	18.43	18	100	-0.68	-0.15
Vegans	71.24	24.42	0	100	-0.5	-0.53
Sikh vegetarians/vegans	72.54	24.01	4	100	-0.48	-0.76

*Note.* N=327. RWA=right-wing authoritarianism; SDO=social dominance orientation; SYMB = symbolic threat; ANX = intergroup anxiety; STE = Negative stereotypes; DOM = group dominance threat; SOC = social threat; VEG= veganism threat; JS= Attitude ratings of target, Vegans= Attitude ratings of vegans, Sikh vegans/vegetarians=Attitude ratings of Sikh vegans/vegetarians.

**Comparison of target group ratings (Hypothesis 1a).** To test Hypothesis 1a, that Sikh vegans/vegetarians would be rated least favourably compared to other groups – across conditions - a one-way repeated measures ANOVA with the group ratings as the independent variable and the attitude ratings towards the various target groups as dependent variables, was run. Results revealed that there were significant differences between ratings of target groups, Wilk's Lambda = .803,  $F(8, 327) = 10.04$ ,  $p < .001$ ,  $\eta^2 = .20$ . Pairwise comparisons revealed no significant differences between the mean ratings of vegans (the diet-based outgroup), and Sikh vegans/vegetarians (the double outgroup),  $p = .169$ . Further, both of these groups were rated significantly less favourably than most of the other target groups (see Table 1.2 to compare mean ratings of these groups). Specifically, vegans and Sikh vegans/vegetarians were rated significantly lower than vegetarians ( $p < .001$  and  $p = .001$  respectively), omnivores ( $p < .001$  for both), Sikh omnivores ( $p = .003$  and  $p = .02$ , respectively) and Christian omnivores ( $p < .001$  for both). Vegans were also rated significantly lower than Christian vegans/vegetarians ( $p = .002$ ). Therefore, Hypothesis 1a was not supported as there was no significant difference in the mean ratings of vegans and Sikh vegans/vegetarians.

Table 1.2

*Means and standard deviations for all target group ratings across conditions in Study 1.*

Group Ratings	Mean (SD)
Sikhs	73.87 (22.99)
Christians	76.24 (21.95)
Vegans	71.45 (24.43)
Vegetarians	75.17 (22.32)
Omnivores	81.00 (20.85)
Omnivore Christians	77.40 (21.26)
Omnivore Sikhs	74.39 (22.17)
Vegan or vegetarian Christians	72.60 (24.15)
Vegan or vegetarian Sikhs	73.89 (23.09)

Note. N = 327.

**The effect of target religion and diet on ratings of the target (Hypothesis 1b).** A two-way ANOVA with religion and diet as IVs and rating of the target individual as the DV was conducted to evaluate Hypothesis 1b. Results are displayed in Table 1.3. There was no main effect of diet, and the interaction was not significant, contrary to predictions. There was no significant difference between target ratings in the omnivore conditions ( $M=76.52$ ,  $SD=17.63$ ) and the vegan/vegetarian conditions ( $M=75.90$ ,  $SD=19.12$ ). There was a main effect of religion, with the target being rated significantly more favourably in the Sikh ( $M=78.26$ ,  $SD=17.83$ ) compared to the Christian ( $M=74.11$ ,  $SD=18.95$ ) conditions. Overall, these findings were inconsistent with Hypothesis 1b.

Table 1.3

*Two-Way Analysis of Variance of Target Religion and Diet by Attitudes Towards the Target*

	<i>df</i>	<i>F</i>	<i>p</i> -value	Partial Eta Squared
Target Religion	1	4.26	.04*	.01
Target Diet	1	.05	.83	.00
Target Religion x Diet	1	.23	.63	.00
Total	327			

Note. N = 327. \*\* indicates the path is significant at  $p < .01$ , \* indicates the path is significant at  $p < .05$ .  
 DV: Attitude Ratings of J.S. (target individual).

**Correlations between ideology, threat and prejudice.** Zero-order correlations among the study variables are reported in Table 1.4. In general, sociopolitical ideology and perceived threat were significantly, and positively inter-correlated, with a few exceptions: RWA did not significantly correlate with intergroup anxiety, symbolic threat or attitudes towards JS. Further, consistent with Hypothesis 2, greater RWA and greater SDO significantly correlated negatively to attitudes towards vegans and Sikh vegans/vegetarians (see Table 1.4). SDO also correlated with negative attitudes towards the target (J.S.). Lastly, the correlations between higher intergroup anxiety, group dominance threat and social threat, and more negative attitudes towards vegans, Sikh vegans/vegetarians and J.S, were significant. Symbolic threat, negative stereotypes and veganism threat were not significantly correlated with attitudes towards J.S. It also worth noting that overall, all the significant correlations between ideology, threat and intergroup attitude variables were small ( $r$  between .00 and .30) or moderate ( $r$  between .30 and .50).

Table 1.4

*Means, standard deviations and correlations among Study 1 variables*

Variables	Mean (SD)	1	2	3	4	5	6	7	8
1. RWA	3.40 (1.14)								
2. SDO	2.46 (.82)	.52**							
3. Intergroup Anxiety	2.95 (1.12)	.08	.13**						
4. Negative Stereotypes	18.40 (16.27)	.30**	.23**	.22**					
5. Symbolic Threat	3.38 (.88)	.10	.11*	.28**	.25**				
6. Group Dominance Threat	3.51 (.95)	.19**	.24**	.23**	.24**	.24**			
7. Social Threat	2.47 (.99)	.30**	.36**	.34**	.34**	.36**	.41**		
8. Veganism Threat	2.35 (.74)	.30**	.29**	.28**	.26**	.37**	.20**	.37**	
9. JS ratings	76.20 (18.48)	-.03	-.11*	-.21**	-.05	-.06	-.23**	-.22**	-.05
10. Vegan ratings	71.02 (24.64)	-.12*	-.24**	-.28**	-.00	-.13*	-.13*	-.15**	-.22**
11. Sikh vegetarian/vegan ratings	72.11 (24.64)	-.19**	-.26**	-.33**	-.04	-.14*	-.14*	-.23**	-.19**

Note. N=327. Bootstrapping with 1000 samples was used with 95% confidence intervals. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . RWA=right-wing authoritarianism; SDO=social dominance orientation; SYMB = symbolic threat; ANX = intergroup anxiety; STE = Negative stereotypes; DOM = group dominance threat; SOC = social threat; VEG= veganism threat; JS= Attitude ratings of target, Vegans= Attitude ratings of vegans, Sikh vegans/vegetarians=Attitude ratings of Sikh vegans/vegetarians.

**Regression analyses with ideology, religion and diet.** Three regression analyses were conducted with ideology (RWA, SDO), target religion (Sikh, Christian) and target diet (vegan, vegetarian, omnivore) as IVs in each model to evaluate whether ideology, religion, and diet interacted to predict attitudes towards the target individual (JS), vegans, and Sikh vegans/vegetarians. Results for each of the regressions are reported in Appendix O. There were no significant interactions between religion, diet, and ideology for any of the DVs. A significant effect of target religion was found when only target religion, target diet and ideology were entered as IVs in the regression model, with no interactions ( $p=.04$ ). However, no significant effects of target condition (religion or diet) were found when the interactions of various ideology and condition variables were added in the regression model. Therefore, mediation analyses across conditions were conducted.

**Testing the proposed mediation models (Hypothesis 3).** One goal of the present thesis was to evaluate whether the three specific mediation models (i.e. DPM inspired, ITT-inspired and a veganism threat model) were supported (i.e. Hypotheses 3a, 3b, 3c). Therefore, three path models using AMOS were conducted, based on maximum likelihood procedure and bias-corrected estimates for direct and indirect effects derived from bootstrapping using 1000 samples. As discussed earlier in the Results section, realistic threat was dropped from the ITT-inspired model because of non-normality. All models were fully saturated ( $df=0$ ), therefore no fit indices are reported. The results for the individual models are presented in Appendix P. Across these models SDO (but not RWA) had significant direct effects on attitudes towards vegans and Sikh vegans/vegetarians. None of the ideology variables had direct effects on attitudes towards J.S. Here, I focus on the multiple mediator model (Hypothesis 3d) as conceptually, it encompasses all of three models.

**The Multiple Mediator Model (Hypothesis 3d).** Common to all of the mediation models is the notion that threat mediates the relation between ideology and attitudes. To examine the unique indirect effects of each threat variable, a multiple-mediator model was run in PROCESS version 3 using model 4. Two sets of models were run, one set with RWA as the IV and one with SDO as the IV. In both models, all threat types (i.e. intergroup anxiety, negative stereotypes, symbolic threat, group dominance threat, social threat and vegan threat) were entered as mediators. Separate models for each attitude variable were run: i.e. models for attitudes towards JS, vegans, or Sikh vegans/vegetarians. Tests of mediation were conducted using 95% confidence intervals of the indirect effect derived from bootstrapping. Using pairwise comparisons (contrasts), the indirect effects of the different mediators (threat types) were compared. Tables 1.5a and b, and 1.6a and b summarize the direct and indirect effects obtained with RWA or SDO as predictors, respectively.

***RWA multiple mediator models.*** As shown in Table 1.5a, RWA had significant direct positive effects on negative stereotypes, group dominance threat, social threat and veganism threat. The direct effects of RWA on intergroup anxiety and symbolic threat were not significant. Intergroup anxiety, group dominance threat and social threat had significant direct negative effects on attitudes towards JS. Negative stereotypes, symbolic threat and veganism threat did not have significant direct effects on JS (see Table 1.5b). With respect to attitudes towards vegans, only intergroup anxiety and negative stereotypes showed significant direct negative effects. RWA and other threat types had no significant direct effects on attitudes towards vegans. Lastly, only RWA and intergroup anxiety had significant direct negative effects on attitudes towards Sikh vegans/vegetarians. RWA and the threat variables together explained 10%, 12% and 15% variance in attitudes towards JS, vegans and Sikh vegans/vegetarians, respectively.



The indirect effects of RWA on attitudes towards JS, vegans, or Sikh vegans/vegetarians via threat were significant for some of the threat variables. The indirect effects of RWA on attitudes towards JS were significant via group dominance threat and social threat. The indirect effects on attitudes towards vegans or Sikh vegans/vegetarians were significant only through negative stereotypes. The significant indirect effects were very small and in the negative direction, with the exception of all the effects through negative stereotypes, which were unexpectedly in the positive direct (see Table 1.5b for values). Therefore, Hypothesis 3d was partially supported, with the data providing evidence for pathways from RWA to attitudes towards the target individual and groups via threat perceptions.

The relative strength of the mediators was examined using the pairwise contrasts of indirect effects option on PROCESS with model 4. The test compares the relative strength of each mediator variable. A significant effect indicates that the indirect effect of one mediator was stronger than another. As noted earlier, the indirect effects are reported in Table 1.5b. Pairwise comparisons of indirect effects of threat revealed that veganism threat had significantly stronger effects than group dominance,  $b = .05$ ,  $SE = .02$ , 95% CI = [.00, .09], and social threat,  $b = .06$ ,  $SE = .03$ , 95% CI [.01, .13] on attitudes towards JS. Similarly, symbolic threat also had stronger effects than group dominance,  $b = .04$ ,  $SE = .02$ , 95% CI = [.01, .07], and social threat,  $b = .05$ ,  $SE = .03$ , 95% CI = [.01, .11] on attitudes towards JS. These comparisons also showed that social threat had stronger effects than negative stereotypes,  $b = -.06$ ,  $SE = .03$ , 95% CI = [-.12, -.01] on attitudes towards JS. Similar pairwise comparisons of threat types for attitude towards vegans revealed that intergroup anxiety had a stronger effect than negative stereotypes,  $b = -.05$ ,  $SE = .02$ , 95% CI = [-.09, -.01]. Veganism threat,  $b = -.07$ ,  $SE = .03$ , 95% CI = [-.13, -.02], symbolic threat,  $b = -.03$ ,  $SE = .02$ , 95% CI = [-.07, -.00], and group dominance threat,  $b = -.04$ ,  $SE = .02$ ,

95% CI = [-.09, -.01] had larger effects than negative stereotypes, respectively. Lastly, pairwise comparisons for Sikh vegans/vegetarians showed that intergroup anxiety,  $b = -.05$ ,  $SE = .02$ , 95% CI = [-.10, -.01], group dominance threat,  $b = -.04$ ,  $SE = .02$ , 95% CI = [-.08, -.00] and social threat,  $b = -.06$ ,  $SE = .03$ , 95% CI = [-.13, -.01], all had larger effects than negative stereotypes.

Table 1.5a

*Standardized direct effects of RWA on all threat variables in Study 1*

IV	Criteria					
	ANX	STE	SYM	DOM	SOC	VEG
Direct effect:						
RWA	.07[-.04, .18]	.30**[.20, .40]	.10[-.01, .20]	.19**[.08, .29]	.31**[.20, .41]	.30**[.20, .40]
$R^2$	.01	.09	.03	.01	.09	.09

*Note.*  $N = 327$ . \*\* indicates the path is significant at  $p < .01$ , \* indicates the path is significant at  $p < .05$ . RWA=right-wing authoritarianism; SYMB = symbolic threat; ANX = intergroup anxiety; STE = Negative stereotypes; DOM = group dominance threat; SOC = social threat; VEG= veganism threat.

Table 1.5b

*Standardized direct and indirect effects of RWA and all threat variables, on attitude ratings for the target individual, vegans and Sikh vegans/vegetarians in Study 1*

IV	Criteria		
	JS	Vegans	Sikh vegans/vegetarians
Direct effects:			
RWA	.72[-1.43, 2.86]	-2.23[-5.04, .58]	-3.73**[-6.47, -.99]
ANX	-3.00**[-5.11, -.89]	-6.29**[-9.07, -3.52]	-7.34**[-10.03, -4.66]
STE	.80[-1.38, 2.99]	3.31**[.27, 6.35]	3.14**[.18, 6.09]
SYM	1.10[-1.10, 3.30]	.07[-2.81, 2.94]	.14[-2.66, 2.95]
DOM	-3.01**[-5.18, -.84]	-1.57[-4.41, 1.28]	-.66[-3.43, 2.11]
SOC	-2.98**[-5.36, -.59]	-.36[-3.49, 2.78]	-2.42[-5.47, .63]
VEG	1.00[-1.25, 3.25]	-2.95[-5.94, .58]	-.66[-3.56, 2.24]
Indirect effect via:			
ANX	-.01[-.04, .01]	-.02[-.05, .01]	-.02[-.05, .01]
STE	.01[-.02, .05]	.03**[.00, .07]	.03**[.00, .07]
SYM	.01[-.01, .02]	.00[-.02, .01]	.00[-.01, .01]
DOM	-.03**[-.06, -.00]	-.01[-.04, .01]	-.01[-.03, .02]
SOC	-.05**[-.10, -.01]	-.00[-.05, .04]	-.03[-.08, .01]
VEG	.02[-.02, .06]	-.04[-.09, .01]	-.01[-.05, .03]
R <sup>2</sup>	.10	.12	.15

*Note.*  $N = 327$ . \*\* indicates the path is significant at  $p < .01$ , \* indicates the path is significant at  $p < .05$ . RWA=right-wing authoritarianism;

SYMB = symbolic threat; ANX = intergroup anxiety; STE = Negative stereotypes; DOM = group dominance threat; SOC = social threat; VEG=

veganism threat; JS= Attitude ratings of target, Vegans= Attitude ratings of vegans, Sikh vegans/vegetarians=Attitude ratings of Sikh vegans/vegetarians.

***SDO multiple mediator models.*** As shown in Table 1.6a, SDO had significant direct (positive) effects on all threat variables. SDO and intergroup anxiety showed significant negative direct effects on attitudes towards vegans (see Table 1.6b). Stereotype threat, however, was significantly, positively associated with attitudes towards vegans. Symbolic threat, group dominance threat, social threat and veganism threat had no significant direct effects on attitudes towards vegans. Further, although intergroup anxiety, group dominance threat and social threat had significant negative direct effects on attitudes towards JS, SDO, symbolic threat, negative stereotypes and veganism threat did not have any significant direct effects on attitudes towards JS. Lastly, only SDO and intergroup anxiety had significant negative direct effects on attitudes towards Sikh vegans/vegetarians.

The indirect effects of SDO on attitudes towards JS, vegans or Sikh vegans/vegetarians via threat were significant for specific threat variables. The indirect effects of SDO on attitudes towards JS were significant via intergroup anxiety, group dominance threat and social threat. Indirect effects on attitudes towards vegans or Sikh vegans/vegetarians were significant through intergroup anxiety and negative stereotypes. All these effects were very small and negative, with the exception of the indirect effect through negative stereotypes for attitudes towards Sikh vegans/vegetarians, which was unexpectedly in the positive direction. Generally, being higher (vs. lower) on SDO predicted more negative attitudes towards JS, vegans, and Sikh vegans/vegetarians, with this effect being mediated by perceptions of threat. Therefore, Hypothesis 3d was partially supported, with the data providing evidence for pathways from SDO predicting attitudes.

The relative strength of the mediators was examined using the pairwise contrasts of indirect effects option on PROCESS with model 4. The test compares the relative strength of

each mediator variable. A significant effect indicates that the indirect effect of one mediator was stronger than another. As noted earlier, the indirect effects are reported in Table 1.6b. Pairwise comparisons of indirect effects of threat revealed that intergroup anxiety had larger significant effects than veganism threat,  $b = -.04$ ,  $SE = .02$ , 95%  $CI = [-.09, .00]$ , symbolic threat,  $b = -.03$ ,  $SE = .02$ , 95%  $CI = [-.06, -.00]$ , and negative stereotypes,  $b = -.03$ ,  $SE = .02$ , 95%  $CI = [-.07, -.00]$ . Veganism threat had larger effects than group dominance,  $b = .06$ ,  $SE = .02$ , 95%  $CI = [.01, .10]$  and social threat,  $b = .07$ ,  $SE = .03$ , 95%  $CI = [.01, .14]$ , on attitudes towards JS. Similarly, symbolic threat also had larger effects than group dominance,  $b = .04$ ,  $SE = .02$ , 95%  $CI = [.01, .08]$  and social threat,  $b = .06$ ,  $SE = .03$ , 95%  $CI = [.01, .11]$ , on attitudes towards JS. Additionally, these pairwise comparisons showed that group dominance,  $b = -.05$ ,  $SE = .02$ , 95%  $CI = [-.09, -.01]$  and social threat,  $b = -.06$ ,  $SE = .03$ , 95%  $CI = [-.12, -.01]$  had larger effects than negative stereotypes, on attitudes towards JS.

Similar pairwise comparisons of threat types for attitudes towards vegans revealed that intergroup anxiety had a larger effect than symbolic threat,  $b = -.03$ ,  $SE = .02$ , 95%  $CI = [-.07, -.00]$  and negative stereotypes,  $b = -.06$ ,  $SE = .02$ , 95%  $CI = [-.10, -.02]$ . Veganism threat,  $b = -.06$ ,  $SE = .02$ , 95%  $CI = [-.11, -.01]$  and group dominance threat,  $b = -.04$ ,  $SE = .02$ , 95%  $CI = [-.08, -.00]$  also had larger effects than negative stereotypes respectively, on attitudes towards vegans. Lastly, pairwise comparisons for Sikh vegans/vegetarians showed that intergroup anxiety had a larger effect than symbolic threat,  $b = -.03$ ,  $SE = .02$ , 95%  $CI = [-.08, -.00]$  and negative stereotypes,  $b = -.06$ ,  $SE = .02$ , 95%  $CI = [-.11, -.02]$ .

Table 1.6a

*Standardized direct effects of SDO on all threat variables in Study 1*

IV	Criteria					
	ANX	STE	SYM	DOM	SOC	VEG
Direct effects:						
SDO	.15**[.02,.28]	.27**[.14,.39]	.14**[.01,.27]	.29**[.16,.41]	.43**[.30,.55]	.34**[.22,.47]
R <sup>2</sup>	.02	.05	.01	.06	.12	.08

*Note.*  $N = 327$ . \*\* indicates the path is significant at  $p < .01$ , \* indicates the path is significant at  $p < .05$ . SDO = social dominance orientation; SYMB = symbolic threat; ANX = intergroup anxiety; STE = Negative stereotypes; DOM = group dominance threat; SOC = social threat; VEG = veganism threat.



Table 1.6b

*Standardized direct and indirect effects of SDO and all threat variables, on attitude ratings for the target individual, vegans and Sikh vegans/vegetarians in Study 1*

IV	Criteria		
	JS	Vegans	Sikh vegans/vegetarians
Direct effects:			
SDO	-.42[-3.00, 2.15]	-6.34**[-9.63, -3.04]	-6.27**[-9.51, -3.04]
ANX	-3.07**[-5.17, -.97]	-6.22**[-8.93, -3.51]	-7.17**[-9.82, -4.52]
STE	.99 [-1.16, 3.14]	3.35** [.40, 6.30]	2.88[-.01, 5.78]
SYM	1.01 [-1.19, 3.21]	-.13 [-2.95, 2.70]	.06[-2.72, 2.83]
DOM	-2.95**[-5.12, -.77]	-1.15 [-3.96, 1.65]	-.32[-3.07, 2.42]
SOC	-2.76**[-5.17, -.35]	.50 [-2.61, 3.61]	-1.85[-4.90, 1.19]
VEG	1.22 [-1.01, 3.45]	-2.53 [-5.43, .38]	-.57[-3.41, 2.27]
Indirect effect via:			
ANX	-.02**[-.05, -.00]	-.03**[-.07, -.01]	-.03**[-.07, .00]
STE	.01 [-.01, .04]	.03**[.01, .05]	.02**[.00, .05]
SYM	.01 [-.01, .03]	-.00 [-.02, .02]	.00[-.01, .02]
DOM	-.04**[-.07, -.01]	-.01 [-.04, .02]	-.00[-.03, .02]
SOC	-.05**[-.10, -.01]	.01[-.04, .05]	-.03[-.08, .02]
VEG	.02 [-.01, .05]	-.03[-.07, .01]	-.01[-.04, .03]
R <sup>2</sup>	.10	.15	.17

*Note.*  $N = 327$ . \*\* indicates the path is significant at  $p < .01$ , \* indicates the path is significant at  $p < .05$ .

SDO = social dominance orientation; SYMB = symbolic threat; ANX = intergroup anxiety; STE = Negative stereotypes; DOM = group dominance threat; SOC = social threat; VEG= veganism threat; JS= Attitude ratings of target, Vegans= Attitude ratings of vegans, Sikh vegans/vegetarians=Attitude ratings of Sikh vegans/vegetarians

## Discussion

The goal of Study 1 was to examine the role of religious affiliation, ideology, and threat in diet-based prejudice, with a specific focus on vegans and Sikh vegans/vegetarians. Contrary to Hypothesis 1a, across conditions, Sikh vegetarians/vegans (i.e. the double outgroup) were not rated less favourably than vegans (with no religious identity salient). In other words, the double jeopardy hypothesis (Doyd & Bengston, 1978) was not supported, as the double outgroup was not subject to more prejudice than the single outgroup. MacInnis and Hodson (2017) reported that vegans who chose their diet for religious reasons (vs. vegans without a salient motivation) were rated significantly more favourably. This pattern implies the possibility of a buffering effect of religion. The current findings cannot inform this possibility, as the means for these two groups were not statistically different. Future research might explore this possibility further.

Hypothesis 1b – which concerned the target *individual* –also did not receive any support, as there were no significant interactions between the diet and religious identity of the target individual. The target was not rated least favourably when he was identified as a Sikh vegan/vegetarian (member of the double outgroup). Whether the target was vegan/vegetarian or omnivore did not significantly affect their rating. However, there was a significant effect of religion such that the Sikh targets were rated more favourably than Christian targets. This in contrast to previous research done in Canada, with community (Kalin & Berry, 1995) and undergraduate samples (Zafar & Ross, 2015), which found that participants had more positive attitudes towards Christians than Sikhs.

Consistent with Hypothesis 2 and previous research (e.g. MacInnis & Hodson, 2017), people who scored higher (vs. lower) on RWA or SDO reported less favourable attitudes towards

vegans. Hence, this research indicates that the robust prejudice shown by those higher in right-wing ideologies extends to prejudice toward vegans. Notably, the negative relation with SDO was stronger than with RWA. This pattern replicates that found by MacInnis and Hodson (2017). Related research might inform why SDO more strongly relates to prejudice towards vegans than RWA. SDO (but not RWA) explains the association between speciesism and human outgroup attitudes (Dhont, Hodson, Costello & MacInnis, 2014). For people higher on SDO, vegans may represent a rejection of the legitimizing myth of human dominance over animals and thus be disliked (as discussed in Judge & Wilson, 2018).

As noted earlier, several theories highlight the importance of threat in explaining prejudice and its association with ideological beliefs. Namely, the DPM identifies social threat and group dominance threat as underlying prejudice stemming from RWA and SDO, respectively (Duckitt, 2001; Duckitt & Sibley, 2009); and the ITT identifies symbolic threat, realistic threat, intergroup anxiety, and negative stereotypes as predicting prejudice (Stephan & Stephan, 2000), with links to RWA and SDO (Stephan & Stephan, 1996, 2000). More recently, researchers have demonstrated the relevance of veganism threat in particular (Earle & Hodson, 2017; MacInnis & Hodson, 2017). Consistent with these theories and related empirical work, all of the threat variables were found to be correlated to greater prejudice toward vegans and vegan/vegetarian Sikhs, with the exception of non-significant relations with negative stereotypes. Further, the correlations amongst the threat variables were weak to moderate implying relative uniqueness of the different types of threats. Finally, endorsing RWA or SDO were associated with perceiving more threat, with the exception of non-significant relations between RWA with symbolic threat and intergroup anxiety. Therefore, in general, the findings from Study 1 indicate that right-wing ideology is associated with threat-sensitivity.

Theory and research on the DPM (Duckitt, 2001; Duckitt & Sibley, 2009), ITT (Stephan & Stephan, 1996, 2000), and vegan threat model (MacInnis & Hodson, 2017) all position threat as the link between right-wing ideology and prejudice. Consistent with Hypothesis 3d, the pathways from RWA or SDO to attitudes towards the target groups (vegans and Sikh vegans/vegetarians) and the target individual (J.S) were mediated by perceptions of threat. Four threat variables emerged as unique mediators when entered into a model with all of the threat variables: group dominance threat, social threat, intergroup anxiety and negative stereotypes. The finding that higher group dominance threat and higher social threat explained the effects of ideology (RWA and SDO) on attitudes towards J.S. is consistent with the DPM (Duckitt, 2001; Duckitt & Sibley, 2009). However, social threat and group dominance threat did not have stronger mediating effects for RWA and SDO, respectively, as is outlined in the DPM. Rather, the mediating effects of the two threat types were similar in magnitude for both ideologies. The finding that negative stereotypes and intergroup anxiety emerged as significant unique mediators is consistent with ITT (Stephan & Stephan, 2000). Further, consistent with previous research (Costello & Hodson, 2011; Stephan & Renfro, 2002), endorsing negative stereotypes best explained the effects of higher RWA on attitudes towards vegans and Sikh vegans/vegetarians, and higher intergroup anxiety best accounted for the relationship between higher SDO and less favourable ratings of JS, vegans and Sikh vegans/vegetarians. Symbolic and realistic threat did not mediate relation between ideology and attitudes, inconsistent with previous research (Caricati, Mancini & Marletta, 2018).

An important thing to note for all the analyses in Study 1 involving group dominance threat is that the group dominance scale used for this study had low reliability ( $\alpha = .48$ ). This may have affected the findings for analyses that included group dominance threat, such as

relationships between group dominance, and ideology and attitudes towards vegans and Sikh vegans/vegetarians in the correlational analyses and various mediation models.

In summary, Study 1 showed that ideology and threat predict prejudice towards vegans and Sikh vegans/vegetarians. Vegans were one of the least favourably rated groups out of all the diet-based and religious groups. In addition to better understanding the nature of prejudice towards vegans, another goal of the current thesis was to explore possible prejudice-reduction interventions. Previous research shows that imagined contact is associated with more positive intergroup attitudes and positive behavioural intentions (see Miles & Crisp, 2014). Therefore, in a second study, I investigated whether imagined contact (Crisp & Turner, 2009) (vs. a control) might predict less negative attitudes towards vegans.

## Study 2

### Hypotheses

Study 2 investigated prejudice towards vegans specifically, and explored the effect of imagined contact (vs. a neutral, control condition) on prejudice. Based on previous research on right-wing ideologies (Altemeyer, 1981; Dhont et al., 2014; Judge & Wilson, 2018; MacInnis & Hodson, 2017; Pratto et al., 1994), it was predicted that people higher (vs. lower) on RWA or SDO would be more prejudiced towards vegans (Hypothesis 1). Drawing from the imagined intergroup contact hypothesis (Crisp & Turner, 2009; Turner et al., 2007), it was predicted that participants that imagine having positive contact with vegans would report more positive outgroup attitudes and positive behavioural intentions, compared to those in the control condition (Hypothesis 2). A moderated mediation model was also tested (Hypotheses 3a and 3b). Specifically, drawing on the DPM (Duckitt & Sibley, 2009, 2010) and previous research (Asbrock, Christ, Duckitt, & Sibley, 2012), it was predicted that ideology may moderate the effects of imagined contact (Hypothesis 3a). Further, drawing on the ITT (Stephan & Stephan, 2000; Stephan 2014), and the findings from the imagined contact literature (Stathi & Crisp, 2008; Stephan, 2014; Hypothesis 3b), it was expected that the lower prejudice in the imagined contact condition (vs. neutral control condition) would be mediated by lower intergroup anxiety.

### Method

**Participants and procedures.** A power analysis using G\*Power, for four predictors and an expected medium effect size (based on the findings of Miles & Crisp, 2014), recommended a minimum sample size of 129 participants. Participants were 137 undergraduate students from the SONA participant pool at Ryerson University (Mage = 19.60, SD = 2.33; Gender: Male 17.5%, Female 82.5%; Ethnicity: White/Caucasian 40.4%, Filipino 8.8%, South Asian 9.6%, Southeast Asian 4.4%, Latin American 2.2%, Chinese 4.4%, Arab/West Asian 8.1%, Black 8.8%, Korean

0.7%, Other 12.5%; Religious Affiliation: Buddhist 1.5%, Hindu 3.0%, Christian 43.7%, Muslim 14.1%, Sikh 2.2%, Jewish 5.2%, Atheist 12.6%, Other 17.8%; Diet: Vegetarian 6.6%, Omnivore 89.8%, Vegan 3.6%). To control for ingroup biases, data from 14 participants who were vegan or vegetarian, was excluded. Participants were given course credit in exchange of their participation.

This study was conducted at the Social and Political Psychology Lab (SPP Lab) at Ryerson University. After arriving at the lab, participants first read and signed a consent form outlining their rights as a participant and general information about the study's procedures. After providing their consent, they were randomly assigned to either the control condition or the imagined contact condition. In the imagined contact condition (a modified version of EIC), participants were asked to imagine an interaction with a vegan in a positive context, specifically a cooperative, team-building activity (see e.g. Choma et al., 2014). They were asked to imagine meeting the individual, their appearance and the ensuing conversation and activity. The following script was read out to participants, in this condition:

“I would like you to imagine that you are about to meet someone for the first time. This person is vegan. He/she does not consume any meat, dairy, eggs or honey. Another researcher brings him/her into this room to complete this portion of the study. He/she smiles at you and introduces him/herself as “J.S”. You shake his/her hand and introduce yourself, sharing your name. Take a moment to imagine what he/she looks like. The experimenter then says that he/she needs to leave the room momentarily to collect some materials. When he/she leaves, J.S politely asks you if you are a student at the university and you respond. In turn, you ask him/her the same. Before you can talk any further, the experimenter returns and says he/she is

ready to get started. Smiling, he/she says that you and your partner are going to thumb wrestle. He/she then reviews the rules of thumb wrestling. The object of the game is to pin your partner's thumb for a count of three as many times as you can. Face your partner and hold out your right hand in a "thumbs up" position. Now place your hands in a money grip. The way to play the game is to start by saying "one, two, three, four, I declare a thumb war" with your thumbs passing each other as you say each word of the rhyme. You and your partner are going to thumb wrestle for 30 seconds, I want you to try and get as many pins as possible. As the experimenter is getting his/her stopwatch ready, J.S looks at you and exclaims, "Hey, I think if we take turns pinning each other's thumbs we should be able to get more pins!" The experimenter then starts the timer for 30 seconds. The experimenter says go and you begin. "One, two, three, four, I declare a thumb war." You pin J.S' thumb—one! You say again, "one, two, three, four, I declare a thumb war." He/she pins your thumb— two! You manage to repeat this six more times for a total of eight pins! You feel good about what you and J.S have accomplished and realize that you're actually having some fun working with him/her to complete the task. The experimenter then tells you that you have done an excellent job figuring out how to get as many pins as possible in 30 seconds. You and J.S smile at each other, and exchange a high five to celebrate your success. The experimenter then thanks you for your time. J.S says, "it was great to meet you!"

In the control condition participants were asked to imagine an outdoor scene (e.g. a beach or a forest) and its various aspects (Turner et al., 2007). The followings script was read out to participants, in this condition: "I would like you to imagine an outdoor scene for 2-3 minutes.



Try to imagine specific aspects of the scene (e.g. what is the landscape like, is it a beach, a forest, are there trees, hills, what's on the horizon).”

Afterwards, participants were then asked to list what they envisioned in the imagined scenario in their respective conditions (Turner et al., 2007). Finally, after this intervention and the following description item, participants completed the following measures, in the order in which they are listed: Evaluations of target groups and target individual (for imagined contact condition only), intergroup anxiety, symbolic and realistic threat perceptions, negative stereotypes, group dominance and social threat perceptions, veganism threat, item about dietary choices, RWA, SDO, and a demographics questionnaire. Before leaving the lab, participants were fully debriefed.

## **Measures**

The same demographic information was measured as in Study 1. The same measures as Study 1: RWA ( $\alpha = .94$ ), SDO ( $\alpha = .82$ ), intergroup anxiety ( $\alpha = .82$ ), realistic threat ( $\alpha = .85$ ), symbolic threat ( $\alpha = .64$ ), veganism threat ( $\alpha = .84$ ), negative stereotypes ( $\alpha = .76$ ), group dominance threat ( $\alpha = .42$ ), and social threat ( $\alpha = .42$ ) scales, attitude thermometers, and open-ended item assessing participants' opinion on vegans, were used in Study 2. For group dominance threat, symbolic threat and social threat, Cronbach's alpha values of  $\alpha < .70$  suggest that the scales had a low degree of internal consistency. The following scales were added for this study:

**Behavioural Intentions.** Participants completed a modified four-item version of the Behavioural Intentions scale used by Husnu and Crisp (2010), adapted to assess their behavioural intentions towards vegans (see Appendix Q). The question stems were identical across groups. Participants indicated the extent to which they considered a statement to be true, with each

statement on the scale ranging from 1 (Not at All) to 7 (Very Much). Scores were created by averaging the items, and higher scores indicated greater willingness to carry out the behaviour being discussed ( $\alpha = .77$ ).

**Intergroup Attitudes.** Participants completed a modified six-item version of the Attitudes scale by Wright et al. (1997), adapted to assess their feelings towards vegans (see Appendix R). The question stems were identical across groups. Participants indicated their feelings towards vegans by choosing between pairs of adjectives, with each pair being rated on a semantic differential scale ranging from 1 (one adjective, e.g. warm) to 7 (the other adjective, e.g. cold). Scores were created by reverse scoring appropriate items, and then averaging all items. Higher scores indicated more negative attitudes towards vegans ( $\alpha = .82$ ).

**Level of Contact Scale.** Participants completed a modified five item version of the Level of Contact scale by Zafar and Ross (2015), adapted to assess their perceived level of contact and familiarity with vegans (see Appendix N). The first two items were open-ended and participants indicated the number of vegan friends they had, and the number of hours per week they spent with them, respectively. In the third and fourth items, participants indicated their degree of contact and interaction with vegans, on a rating scale ranging from 1 (Never) to 5 (All the time). Lastly, participants' knowledge of vegans was assessed in item five, using a rating scale ranging from 1 (None) to 7 (Expert). Higher scores on each individual item indicated higher degree of contact and familiarity with vegans (items one to four), or more knowledge of vegans, in the case of item five ( $\alpha = .78$ , for items three to five).

**Open-ended Response Item About the Imagined Experience.** Participants were asked to describe the imagined experience. In the imagined contact condition, they were asked to talk about their experience with the vegan individual they imagined interacting with. The following

item was administered: “Take a moment to think about the interaction you imagined with J.S. (the person you imagined interacting with). Please use the box below to describe your experience. You can mention your thoughts and feelings about J.S. and the interaction, as well as any physical sensations you experienced.” In the control condition, participants were asked to describe the natural scene they imagined. The following item was administered: “Take a moment to think about the scene you just imagined. Please use the box below to list the different things that you saw in this scene.”

### **Pre-registration**

This study, including its hypotheses and method were pre-registered on the OSF (Open Science Framework) using the AsPredicted registration form. This pre-registration can be viewed on the following page: [https://osf.io/c4gt6/?view\\_only=cbffccc2a625490c8fd65ca819309afd](https://osf.io/c4gt6/?view_only=cbffccc2a625490c8fd65ca819309afd)

### **Data Analysis.**

Data was analyzed using SPSS. I carried out list-wise analyses for this study, and consequently data from 17 participants was excluded. These participants had one or more of the following missing variables in their data: RWA (n=4), Intergroup Anxiety (n=7), Symbolic Threat (n=2), Intergroup Attitudes on the Wright et al. (1997) scale (n=4), Vegan ratings (n=3). Out of the 17 participants, 8 did not have any responses for items for one or more of the above mentioned variables. Therefore, the mean scores for these variables were not computed. On the other hand, 9 participants whose data was deleted, had responded to some items for one or more of the above mentioned variables. For these participants, the mean scores for the above mentioned variables were not computed because they responded to less than 70% of items for them.

## Results

**Descriptive analyses and normality of IVs and DVs.** Descriptive analyses were carried out for all of the continuous variables. Means, standard deviations, skewness and kurtosis statistics for Study 2 variables are shown in Table 2.1. Examination of skewness and kurtosis values, and histograms of each variable revealed that some variables were not normally distributed. Attitude ratings of JS and omnivores were negatively skewed, such that most participants reported favourable attitudes towards these groups. Realistic threat<sup>3</sup> showed a positive skew, such that participants tended to report low levels of threat. For realistic threat, 35.8% of the participants reported a “1”, which was the lowest score for that scale. This contributed to the highly skewed distribution. The RWA and negative stereotypes variables had non-normal distributions as well, with relatively higher frequencies of higher values. Winsorizing of these outliers (+2.5 SDs above the mean) was carried out for both these variables, and it reduced the skewness of their distributions. The winsorized values for these variables are shown in Table 2.1. Lastly, given the issues with non-normality, bootstrapping was performed using 1000 samples for any analyses that included the above mentioned independent variables.

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<sup>3</sup> As the realistic threat variable had a highly skewed, non-normal distribution, any results reported for this variable should be interpreted with caution.

Table 2.1

*Means; standard deviations; skewness; kurtosis; minimum and maximum values of Study 2 variables*

	<i>M</i>	<i>SD</i>	Min	Max	Skewness	Kurtosis
RWA	3.10	1.01	1.14	5.38	0.21	-0.49
SDO	2.56	0.89	1.00	4.63	0.14	-0.78
Realistic Threat	2.06	1.20	1.00	6.00	1.09	0.32
Symbolic Threat	2.88	0.80	1.00	5.50	0.87	1.17
Negative Stereotypes	15.45	8.46	1.00	34.86	0.77	-0.80
Intergroup Anxiety	3.12	1.01	1.00	5.00	-0.26	-1.08
Veganism Threat	2.29	0.65	1.00	4.45	0.46	-0.97
Group Dominance Threat	3.40	0.89	1.25	5.25	-0.05	-0.55
Social Threat	4.17	0.56	2.50	5.50	-0.72	1.87
Attitudes	5.34	0.98	3.17	7.00	-0.12	-0.75
Thermometers	59.33	23.28	.00	100.00	-0.00	-0.53
Behavioural Intentions	3.65	1.27	1.50	6.25	0.02	-0.95

*Note.* N=106. RWA=right-wing authoritarianism; SDO=social dominance orientation; SYMB = symbolic threat; ANX = intergroup anxiety; STE = Negative stereotypes; DOM = group dominance threat; SOC = social threat; VEG= veganism threat; Thermometer = Feeling thermometer ratings of vegans; Attitudes= Attitude ratings of vegans on the Wright et al. (1997) scale; Behavioural Intentions= Behavioural Intentions towards vegans.

**Correlations.** Correlations between the continuous IVs (RWA, SDO), mediators (threat), and DVs (attitude ratings, behavioural intentions) were explored. These zero-order correlations among Study 2 variables are displayed in Table 2.2. Contrary to Hypothesis 1, SDO did not relate to any of the prejudice measures. RWA was significantly, negatively associated with attitudes towards vegans on the Wright et al. (1997) scale only. RWA did not relate to the feeling thermometer rating or behavioural intentions. Thus, Hypothesis 1 was only partially supported.

Sociopolitical ideologies related to several, but not all of the threat perception measures. Specifically, negative stereotypes, realistic threat and veganism threat were correlated positively with both RWA and SDO. Group dominance only related to SDO. Intergroup anxiety, symbolic threat, and social threat did not relate to RWA or SDO. Higher threat perceptions, including higher intergroup anxiety, symbolic and veganism threat were significantly correlated with more negative attitudes towards vegans (on the attitude thermometers as well as the scale by Wright et al., 1997). It also worth noting that overall, almost all of the significant correlations between the above-mentioned variables were small ( $r$  between .00 and .30) or moderate ( $r$  between .30 and .50).

Table 2.2

*Means; standard deviations and correlations among Study 2 variables*

Variables	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11
1. RWA	3.10 (1.01)											
2. SDO	2.63 (.90)	.48**										
3. STE	15.73 (8.62)	.38**	.23*									
4. ANX	3.08 (1.01)	-.02	-.05	.21*								
5. SYM	2.91 (.82)	.11	.08	.14	.32**							
6. REAL	2.08 (1.19)	.34**	.22*	.32**	.31**	.34**						
7. DOM	3.41 (.86)	.24*	.06	-.05	.13	.25*	.14					
8. SOC	4.18 (.59)	-.05	.12	-.02	.00	.18	-.06	-.11				
9. VEG	2.34 (.66)	.39**	.22*	.28**	.31**	.48**	.52**	.20*	.12			
10. Thermometers	58.33 (23.51)	.00	.00	.04	-.33**	-.21*	-.18	-.42**	.09	-.33**		
11. Attitudes	5.35 (1.00)	-.27**	-.10	-.05	-.44**	-.33**	-.29**	-.53**	.03	-.38**	.45**	
12. Intentions	3.67 (1.27)	-.06	-.12	.10	-.15	-.06	-.08	-.31**	-.01	-.17	.41**	.35**

*Note.* N=106. Bootstrapping with 1000 samples was used with 95% confidence intervals. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . RWA=right-wing

authoritarianism; SDO=social dominance orientation; SYM = symbolic threat; ANX = intergroup anxiety; STE = Negative stereotypes; DOM = group dominance threat; SOC = social threat; VEG= veganism threat; Thermometers = Feeling thermometer ratings of vegans; Attitudes = Attitude ratings of vegans on the Wright et al. (1997) scale; Intentions= Behavioural Intentions towards vegans.

**Mean differences between conditions.** One-way ANOVAs were conducted to evaluate whether there were differences between conditions (imagined contact vs. control condition) for the proposed mediator (threat perceptions) and the DVs (thermometer ratings of vegans, ratings of vegans on the Wright et al., 1997 scale, behavioural intention ratings for vegans). Results from the ANOVAs, and condition means and standard deviations are reported in Table 2.3. Consistent with hypothesis 2, there was a significant difference in the mean ratings of vegans (only on feeling thermometer ratings) between the imagined contact and control conditions, such that those in the imagined contact condition reported more positive ratings of vegans than participants in the control condition. Mean ratings of vegans (on the Wright et al., 1997 scale) were almost identical across conditions and high. For mean behavioural intentions, the difference across conditions was not statistically significant. Further, none of the threats differed significantly between the conditions.

One-way ANOVAs were also conducted on the ideology variables. As expected, RWA and SDO did not differ significantly between conditions.



Table 2.3

*One-Way Analysis of Variance of Experimental Condition by Attitude Ratings of Target Groups, Behavioural Intentions, Ideology and Threat Types and Condition Means and Standard Deviations of Dependent Variables in Study 2*

Dependent Variables	<i>M</i> (SD) : Imagined Contact	<i>M</i> (SD): Control	<i>df</i> (between groups, total)	<i>F</i>	<i>p</i> -value	Partial Eta Squared
RWA	3.23 (1.02)	2.98 (1.01)	1, 105	1.68	.20	.02
SDO	2.63 (.88)	2.63 (9.92)	1, 105	.00	1.00	.00
ANX	3.00 (.97)	3.16 (1.04)	1, 105	.71	.40	.02
STE	16.78 (8.57)	14.68 (8.63)	1, 105	1.58	.21	.01
SYM	2.75 (.75)	3.06 (.83)	1, 105	3.83	.05	.03
REAL	2.05 (1.10)	2.10 (1.28)	1, 105	.05	.83	.00
SOC	4.24 (.56)	4.12 (.61)	1, 105	1.16	.28	.01
DOM	3.30 (.86)	3.52 (.86)	1, 105	1.75	.19	.01
VEG	2.40 (.67)	2.27 (.65)	1, 105	.98	.33	.01
Thermometers	63.15 (23.04)	53.51 (23.18)	1, 105	4.61	.03*	.05
Attitudes	5.34 (.92)	5.35 (1.00)	1, 105	.00	.96	.00
Intentions	3.80 (1.22)	3.55 (1.31)	1, 105	.99	.32	.02

Note. *N* = 106. *N* for Imagined Contact condition=53, *N* for Control condition=53. \*\* indicates the path is significant at  $p < .01$ , \* indicates the path is significant at  $p < .05$ . RWA=right-wing authoritarianism; SDO=social dominance orientation; SYM = symbolic threat; ANX = intergroup anxiety; STE = Negative stereotypes; REAL= realistic threat; DOM = group dominance threat; SOC = social threat; VEG= veganism threat; Thermometers = Attitude ratings of vegans on attitude thermometers; Attitudes = Attitude ratings of vegans on the Wright et al. (1997) scale; Intentions= Behavioural Intentions towards vegans.

**Moderated Mediation Model to Test the Effects of Ideology and Intergroup Anxiety (Hypothesis 3a and 3b).** To examine the mediating effects of intergroup anxiety on the relationship between condition and attitude ratings towards vegans, and the potential moderating effect of ideology, a moderated mediation model was run in PROCESS version 3 using model 73. A moderated mediation was only run on the feeling thermometer of vegans given that no differences emerged between conditions for the other two dependent measures (intergroup attitudes and behavioural intentions). The model was run with experimental condition as the IV, intergroup anxiety as the mediator, RWA and SDO as the moderators and attitudes towards vegans as the DV (see Table 2.4 for a summary of results). Tests were conducted using 95% confidence intervals of the direct and indirect effects, derived from bootstrapping. Significant interactions were probed at 1SD above and 1SD below the mean on continuous variables.

As shown in Table 2.4, neither condition nor ideology (RWA or SDO) had any significant direct effects on intergroup anxiety. Condition and ideology (RWA and SDO) together accounted for 5% of the variance in intergroup anxiety. Both condition and intergroup anxiety had significant direct effects on attitudes towards vegans, unlike ideology which did not. Further, there were no significant interactions between condition, ideology and intergroup anxiety. Condition, ideology and intergroup anxiety together explained 18% variance in attitudes towards vegans. Lastly, indirect effects of condition on attitudes towards vegans via intergroup anxiety were not significant. Therefore, the proposed model and Hypotheses 3a and 3b were not supported, with the data providing no evidence for the mediating effect of intergroup anxiety or the moderating effect of ideology, on the relationship between condition, threat and attitudes towards vegans.

Table 2.4

*Direct effects of Condition and Intergroup Anxiety, and moderating effect of Ideology on attitude ratings for vegans in Study 2*

	ANX	Thermometers
Direct effects:		
Cond	-.01 [-.45, .43]	-11.51* [-21.51, -1.51]
ANX		-8.58* [-13.60, -1.51]
RWA	.00 [-.22, .23]	-.06 [-5.22, 5.09]
SDO	.04 [-.23, .30]	1.03 [-5.01, 7.07]
Cond x RWA	.03 [-.43, .48]	1.90 [-8.97, 12.77]
Cond x SDO	-.04 [-.58, .50]	-3.27 [-15.82, 9.28]
ANX x RWA		2.00 [-3.11, 7.11]
ANX x SDO		-3.70 [-9.83, 2.42]
Cond x RWA x SDO	.44 [-.01, .90]	0.16[-13.98, 14.30]
ANX x RWA x SDO		2.84 [-3.11, 8.79]
R <sup>2</sup>	.05	.18

*Note.* N=106. \*\* indicates the path is significant at  $p < .01$ , \* indicates the path is significant at  $p < .05$ . RWA=right-wing authoritarianism; SDO=social dominance orientation; ANX = intergroup anxiety; Cond= Experimental Conditions; Thermometers = Attitude ratings of vegans on attitude thermometers.

**Moderated Multiple Mediation Model to Test the Effects of Ideology and Threat.** To explore the mediating effects of all threat types on the relationship between condition and attitudes ratings of vegans, and the potential moderating effect of ideology, a moderated multiple mediation model was run in PROCESS version 3 using model 73. This model was run with experimental condition as the IV, intergroup anxiety, negative stereotypes, symbolic threat, realistic threat, social threat, group dominance threat and veganism threat as the mediators, RWA and SDO as the moderators and attitudes towards vegans as the DV (see Table 2.5 for a summary of results). Tests conducted using 95% confidence intervals of the direct and indirect effects, derived from bootstrapping. Significant interactions were probed at 1SD above and 1SD below the mean on continuous variables.

Condition did not have any significant direct effects on any of the threat types. As for the ideology variables, only RWA had significant (positive) direct effects on negative stereotypes, realistic threat, group dominance threat and veganism threat. SDO was not associated directly with any threat type. Experimental condition, RWA, and group dominance threat all had significant direct effects on attitudes towards vegans. Condition and group dominance were associated with attitudes towards vegans, as expected: being in the control condition, and being higher on group dominance threat were both uniquely associated with relatively less favourable ratings of vegans. However, RWA had unexpected positive effects on attitudes towards vegans, such that people higher on RWA rated vegans more favourably. Given that these variables were not correlated at the zero-order level; it is possible this finding is a statistical artefact.

In terms of moderation, there were two significant interactions in the model. A three-way interaction between condition, RWA and SDO was significant, such that among those lower in RWA (1 SD below the mean) and higher in SDO (1 SD above the mean), imagined contact (vs.

control) was associated with endorsing negative stereotypes ( $p=.03$ ). The effect of condition on negative stereotypes was not significant for those higher in RWA and lower in SDO ( $p= .34$ ), those lower in both RWA and SDO ( $p=.95$ ) and those higher in both RWA and SDO ( $p= .41$ ). Further, an interaction between SDO and veganism threat was also significant, such that for those lower in SDO (1 SD below the mean) and those having average values of SDO (at the mean), veganism threat was associated with more favourable ratings of vegans ( $p=.02$  for both). The effect of veganism threat on attitudes towards vegans was not significant for those higher in SDO (1 SD above the mean,  $p= .71$ ).

Condition, ideology and threat together explained 58% variance in attitudes towards vegans. Lastly, there were no significant indirect effects of condition on attitudes towards vegans via threat. Overall, the model some support for the moderating effect of ideology, on the relationship between condition, threat and attitudes towards vegans. However, there was no evidence for the mediating effect of any threat type.

Table 2.5a

*Direct effects of Condition and moderating effect of Ideology on threat variables in Study 2*

IV	Criteria						
	ANX	STE	SYM	REAL	SOC	DOM	VEG
Direct effects:							
Cond	-0.01 [-0.45,0.43]	-2.82 [-6.28,0.64]	0.23 [-0.12,0.58]	-0.02 [-0.51,0.47]	-0.16 [-0.42, 0.10]	0.29 [-0.08,0.66]	-0.16 [-0.43,0.11]
RWA	0.00 [-0.22,0.23]	2.72** [0.95,4.50]	0.11 [-0.07,0.29]	0.33* [0.08,0.58]	-0.08 [-0.21,0.06]	0.29** [0.11,0.48]	0.23** [0.09,0.37]
SDO	0.04 [-0.23,0.30]	1.54 [-0.56,3.63]	0.04 [-0.17,0.26]	0.20 [-0.10,0.50]	0.11 [-0.04,0.27]	-0.13 [-0.36,0.09]	0.08 [-0.08,0.24]
Interactions:							
Cond X RWA	0.03 [-0.43,0.48]	1.91 [-1.65,5.46]	0.05 [-0.31,0.41]	-0.24 [-0.74,0.27]	0.1 [-0.16,0.37]	-0.04 [-0.42,0.34]	0.07 [-0.20,0.35]
Cond X SDO	-0.04 [-0.58, 0.50]	-1.05 [-5.24,3.15]	0.18 [-0.24,0.61]	0.27 [-0.33,0.86]	-0.06 [-0.37,0.25]	0.15 [-0.29,0.60]	0.13 [-0.20,0.46]
Cond X RWA X SDO	.44 [-0.01, 0.90]	4.38* [0.82,7.95]	0.21 [-0.15,0.57]	-0.39 [-0.12,0.90]	0.01 [-0.26,0.27]	-0.13 [-0.51,0.25]	0.25 [-0.03,0.53]
R <sup>2</sup>	.05	.22	.09	.15	.05	.13	.18

*Note.* N=106. \*\* indicates the path is significant at  $p < .01$ , \* indicates the path is significant at  $p < .05$ . RWA=right-wing authoritarianism;

SDO=social dominance orientation; ANX = intergroup anxiety; STE = Negative stereotypes; DOM = group dominance threat; SOC = social threat; VEG= veganism threat; Cond= Experimental Conditions.

Table 2.5b

*Direct effects of Condition and Threat, and moderating effect of Ideology on attitude ratings for vegans in Study 2*

IV	Criteria Thermometers
Direct effects:	
Cond	-11.37*[-21.23, -1.51]
ANX	-5.97 [-12.01,0.07]
NEG	-0.07 [-0.83,0.69]
SYM	2.92 [-4.98,10.82]
REAL	1.43 [-3.64,6.50]
SOC	-30.49 [-116.42,55.45]
DOM	-11.67**[-17.8,-5.54]
VEG	-9.62 [-20.40,1.16]
RWA	9.16**[3.08,15.24]
SDO	-2.52[-9.41,4.36]
Interactions:	
Cond X RWA	-0.01[-11.96,11.93]
Cond X SDO	9.34 [-4.76,23.45]
Cond X RWA X SDO	0.16 [-13.98,14.3]
ANX X RWA	1.02 [-4.92,6.95]
STE X RWA	0.32[-0.56,1.21]
SYM X RWA	3.76 [-6.59,14.12]
REAL X RWA	1.91[-4.34,8.15]
SOC X RWA	12.25[-67.77,92.27]
DOM X RWA	1.34[-5.92,8.61]
VEG X RWA	-6.25[-18.00,5.50]
ANX X SDO	-2.93 [-10.66,4.79]
STE X SDO	0.65 [-0.31,1.61]
SYM X SDO	-10.18[-22.17,1.81]
REAL X SDO	-5.15[-10.95,0.65]
SOC X SDO	-80.78[-189.28,27.72]
DOM X SDO	0.00[-8.84,8.83]
VEG X SDO	16.01* [2.76,29.25]
ANX X RWA X SDO	0.66 [-7.96,9.27]
STE X RWA X SDO	0.08 [-0.92,1.07]
SYM X RWA X SDO	3.94 [-4.8,12.67]
REAL X RWA X SDO	0.73[-5.27,6.74]
SOC X RWA X SDO	19.19[-97.31,135.70]

DOM X RWA X SDO	0.21 [-8.65,9.07]
VEG X RWA X SDO	-2.55 [-15.79,10.70]
R <sup>2</sup>	.58

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*Note.* N=106. \*\* indicates the path is significant at  $p < .01$ , \* indicates the path is significant at  $p < .05$ . RWA=right-wing authoritarianism; SDO=social dominance orientation; ANX = intergroup anxiety; STE = Negative stereotypes; DOM = group dominance threat; SOC = social threat; VEG= veganism threat; Cond= Experimental Conditions; Thermometers= Attitude ratings of vegans on attitude thermometers.



## Discussion

The goals of Study 2 were to examine the relation between ideology and prejudice toward vegans, test whether participants who partake in an imagined contact exercise report more favourable attitudes and behavioural intentions towards vegans, explore whether threat mediates the relationships of imagined contact with attitudes and intentions, and evaluate whether ideology might moderate this mediation. Neither RWA nor SDO were associated with attitude thermometer ratings of vegans. This is inconsistent with previous research (MacInnis & Hodson, 2017) and the findings in Study 1. Further, only RWA was found to be significantly associated to less favourable attitudes towards vegans on the Wright et al. (1997) scale. Overall, the association between right-wing ideology and attitudes towards vegans was inconsistent within Study 2 and compared to previous work and Study 1.

There was some minimal support for Hypothesis 2. Participants who imagined interacting with vegans (vs. control condition) reported liking them significantly more as a group on the feeling thermometer. This finding is consistent with previous research showing that imagined intergroup contact can facilitate lower prejudice (Crisp & Turner, 2009; Turner et al., 2007). Contrary to predictions for intergroup attitudes, and previous work showing positive effects of imagined contact on behavioural intentions (e.g., Vezzali, Capozza, Stathi, & Giovannini, 2012); there were no significant differences between conditions on intergroup attitudes as measured by the Wright et al. scale (1997), or in terms of their behavioural intentions towards vegans.

Overall, ideology related positively with threat. Those higher on RWA or SDO were more likely to endorse negative stereotypes, report realistic threat, and perceive veganism threat, consistent with the postulates of the ITT (Stephan & Stephan, 2000) and previous research (Caricati et al., 2017; MacInnis & Hodson, 2017). Interestingly however, being higher on SDO

was not linked significantly with higher perceptions of intergroup anxiety, or higher perceptions of group dominance threat, contrary to the postulates of the ITT (Stephan & Stephan, 2000), the DPM (Duckitt, 2001; Duckitt & Sibley, 2009), and previous research (Costello & Hodson, 2011; Duckitt, 2006).

In general, threat perceptions related negatively to attitudes towards vegans. Consistent with the DPM (Duckitt, 2001; Duckitt & Sibley, 2009) and the ITT (Stephan & Stephan, 2000), and previous research (MacInnis & Hodson, 2017), individuals who perceived higher intergroup anxiety, symbolic threat, group dominance threat or veganism threat reported less favourable attitudes towards vegans on both the feeling thermometers as well as the Wright et al. (1997) scale. Of all the threat variables examined, only group dominance threat related negatively to behavioural intentions, in contrast to previous research (e.g., van Zomeren, Fischer, & Spears, 2007).

As mentioned above, SDO and intergroup anxiety were unrelated in this study, inconsistent with previous research (e.g., Costello & Hodson, 2011). Relatedly, contrary to Hypothesis 3b and previous research (Birtel & Crisp, 2012; Husnu & Crisp, 2010), intergroup anxiety did not explain the relationship between imagined contact and attitudes towards vegans. Further, none of the threat types explained the relationship between imagined contact and attitudes towards vegans. The lack of evidence of the mediating role of threat, particularly for intergroup anxiety and social threat, is inconsistent with previous research that found that intergroup anxiety (Birtel & Crisp, 2012; Husnu & Crisp, 2010) and social threat (Asbrock et al, 2012) respectively, explained the relationship between imagined contact and outgroup attitudes.

Finally, there was partial support for the predicted moderating effect of ideology (Hypothesis 3a) on the relationship between imagined contact and attitudes towards vegans.

Some of the effects of imagined contact on threat, and the relations between threat and prejudice, varied by ideological stance. For those lower in RWA and those higher in SDO, imagined contact predicted higher endorsement of negative stereotypes. Further, for people with lower and average levels of SDO, perceiving more veganism threat predicted more favourable attitudes towards vegans. Thus, like Asbrock et al. (2012), RWA emerged as a moderator of the effects of intergroup contact on threat. Unlike Asbrock et al. (2012), the current thesis also found evidence for the moderating effect of SDO on the relationship between intergroup contact and threat, as well as the relation between threat and prejudice.

## **General Discussion**

With a growing interest in vegan and vegetarian diets and lifestyles, there also seems to be a rise in negative attitudes towards vegans and vegetarians, in social situations as well as print media (Cole & Morgan, 2011). Some preliminary research has also found evidence for prejudice towards vegans (Earle & Hodson, 2017; Judge & Wilson, 2018; MacInnis & Hodson, 2017). Some people adopt a vegan or vegetarian diet style for religious reasons, for example, followers of certain sects of Sikhism (Srivastava, 2007). As mentioned before, attitudes towards people who are vegan or vegetarian for religious reasons are more favourable compared to those who are vegan for environmental or ethical reasons, or when the motivation is not salient (MacInnis & Hodson, 2017). Conversely, according to the postulates of the double jeopardy hypothesis (Dowd & Bengtson, 1978), double outgroups (e.g. vegan/vegetarian Sikhs) are expected to be subject to more prejudice than single outgroups (e.g. vegans). The present thesis sought to address these contradictory findings. Further, given the negative psychological and social impacts of anti-vegan sentiments on vegans (MacInnis & Hodson, 2017), it is important to study bias-reduction interventions. Previous work on imagined contact suggests that imagining interactions with outgroups can promote tolerant attitudes, especially in a positive context (Miles & Crisp, 2014). These interventions have not been explored in the context of prejudice towards diet-based outgroups, including vegans. Therefore, the present thesis investigated whether imagined contact interventions are associated with lower prejudice towards vegans.

### **The Effect of Religion on Diet-Based Prejudice**

In Study 1, Sikh vegans/vegetarians were not rated more negatively than vegans, inconsistent with the double jeopardy hypothesis (Dowd & Bengtson, 1978). This pattern of ratings was also different from the findings of MacInnis and Hodson (2017) whose findings

suggested a buffering effect of religion on attitudes towards vegans and vegetarians. The lack of a moderating effect of religion in the present research may be because participants were not asked to rate vegans or vegetarians based on their explicit motivation for their lifestyles, as they were by MacInnis and Hodson (2017). Instead, participants were asked to rate outgroups with their specific religious and diet-based identities made salient. The feeling thermometer items used for measuring the target group attitudes did not clearly indicate that the vegans/vegetarians identified as Sikh, had chosen their diet for religious reasons. Therefore, for the double outgroup ratings (Sikhs who are vegan/vegetarian), it is reasonable to assume that participants were unable to make the connection between the target group's religious affiliation and motivation for their vegan/vegetarian lifestyle.

Additionally, the lack of a significant buffering effect of religion in Study 1 may be explained by the trend of more positive outgroup ratings in general. For instance, participants from Study 1 rated vegans or vegetarians more favourably than participants from MacInnis' and Hodson's (2017) study. Differences in the demographics of the respective samples, could explain these differences. The sample in Study 1 of the current thesis was entirely comprised of Canadian undergraduate students, who were 19.63 years old on average ( $SD=4.08$ ). In contrast, the sample used by MacInnis and Hodson (2017) was an older North American MTurk community sample ( $M_{age} = 35.75$ ,  $SD = 12.79$ ), with 86% of participants being non-students. With respect to diet-based prejudice, 50% of the Canadians identifying as vegan or vegetarian are under the age of 35 (see Thomson, 2018). Thus, it is reasonable to assume that the undergraduate participants in Study 1 were better acquainted with more people who are vegan, and more familiar with vegan diets and lifestyles than the older participants from the MacInnis and Hodson (2017) study. Thus, it may be the case that participants from the Study 1 sample

were more tolerant towards vegans due to a higher degree of prior familiarity and contact. They may have had direct contact or vicarious contact with vegans, for e.g. knowing people who interact with vegans. Indeed, both direct intergroup contact (Pettigrew & Tropp, 2006) and indirect, “extended” contact (Turner et al., 2007; Wright et al., 1997) have been found to be associated with positive attitudes towards a range of outgroups and across a range of contact settings (Pettigrew & Tropp, 2006).

The effect of familiarity and prior contact (direct or indirect) on vegan prejudice needs to be explored more. Future studies might assess whether participants from a representative community sample (in terms of age and profession) evaluate vegans with distinct motivations for their lifestyle differently from each other. Based on existing research with non-student samples (MacInnis & Hodson, 2017), it is reasonable to propose that vegans for religious reasons will be perceived more favourably than vegans for environmental and ethical reasons, or vegans whose motivation is not made salient.

A main effect of religion on ratings of the target individual emerged in Study 1, but not in the anticipated direction. If a target was Christian, they were liked less by participants than if they were Sikh. It is worth noting that in the current thesis, social desirability may be a potential reason for the more favourable ratings of Sikhs (compared to Christians). In a pluralistic, multi-cultural country such as Canada, it may not be considered socially acceptable to dislike religious outgroups. It is possible that participants wanted to be perceived as having tolerant and egalitarian beliefs, and rated Sikhs more positively than they would have in the absence of this social desirability bias.

## **Ideology and Threat as Predictors of Diet-Based Prejudice**

As discussed before, right-wing ideology (RWA and SDO) has been found to be a robust predictor of outgroup prejudice (Altemeyer, 1981; McFarland & Adelson, 1996; Pratto et al., 1994; Whitley, 1999), including attitudes towards vegans (MacInnis & Hodson, 2017). Given this, right-wing ideology variables (RWA and SDO) were examined as predictors of intergroup attitudes in both studies. I also considered associations between threat and ideology, and threat and attitudes towards Sikh vegans/vegetarians (Study 1), and vegans (Study 1 and 2), given the postulates of the DPM (Duckitt & Sibley, 2009) and the ITT (Stephan & Stephan, 2000), as well as research findings linking threat to ideology and prejudice (MacInnis & Hodson, 2017; McLaren, 2003).

Across both studies, being higher on right-wing ideology was linked to less favourable attitudes towards vegans, consistent with previous work (Judge & Wilson, 2018; MacInnis & Hodson, 2017). However, it is worth noting that ideology was inconsistently related to attitudes towards vegans in Study 2. In Study 2, those higher on RWA reported more negative attitudes towards vegans on the Wright et al. (1997) scale but not on the attitude thermometer scale. The non-normal distribution of average RWA scores in this sample may have contributed to the lack of significant association. Unlike in Study 1, RWA had a skewed distribution in Study 2, with relatively higher frequency of higher values. Winsorizing of outliers had to be carried out to reduce the skewness of this distribution. Also in Study 2, SDO was not significantly related to attitudes towards vegans on either rating scale (thermometer ratings or the Wright et al., 1997 scale). A possible reason for these findings may be small sample size. Compared to other studies that found a significant effect of SDO on attitudes towards vegans, like Study 1 ( $N=406$ ) and

previous research (Judge & Wilson, 2018:  $N=1326$ ; MacInnis & Hodson, 2017:  $N=281$ ), the current study had a much smaller sample size ( $N=137$ ) and as a result, lower power.

According to the DPM (Duckitt, 2001; Duckitt & Sibley, 2009), the ITT (Stephan & Stephan, 2000) and research on veganism threat (Earle & Hodson, 2017; Judge & Wilson, 2018; MacInnis & Hodson, 2017), various unique threats predict outgroup prejudice, including that against vegans. Consistent with these models, across studies, threat types from the ITT (intergroup anxiety and symbolic threat), DPM (group dominance threat), and veganism threat predicted less favourable attitudes towards vegans. The implications of these findings are unpacked below in the section discussing the utility of various threats in understanding prejudice towards vegans.

Overall, ideology positively related with threat, consistent with theory (Duckitt & Sibley, 2009; Stephan & Stephan, 2000) and previous research (Caricati et al., 2017; MacInnis & Hodson, 2017). However, there were a few notable exceptions, such as the lack of association between RWA and symbolic threat in Study 1, and between SDO and intergroup anxiety, and SDO and group dominance in Study 2. These findings may be due to participants' low scores on ideology (RWA and SDO) and threat (particularly symbolic threat, intergroup anxiety and group dominance threat). Such patterns of findings are often observed with post-secondary students, with previous research suggesting that they tend to be lower in right-wing ideological beliefs than non-student adults (McFarland, 2005).

Common among models of ideology, threat and prejudice is the notion that threat can explain the relation between ideology and prejudice (Asbrock et al., 2012; Duckitt & Sibley, 2009; MacInnis & Hodson, 2017; Stephan & Stephan, 2000). There was support for the DPM-inspired model (Duckitt, 2001; Duckitt & Sibley, 2009), group dominance and social threats



explained the relationship between ideology and attitudes towards J.S and Sikh vegans/vegetarians (but not vegans). The veganism threat model (MacInnis & Hodson, 2017) was also supported: veganism threat explained the relationship between ideology (RWA and SDO) and attitudes towards vegans, but not for J.S or Sikh vegans/vegetarians. The ITT threats (Stephan & Stephan, 2000) did not explain the relationship between ideology and attitudes towards vegans or Sikh vegans/vegetarians, contrary to previous research (Costello & Hodson, 2011; McLaren, 2003; Velasco González, Verkuyten, Weesie & Poppe, 2008) and unlike the multiple mediation models in Study 1.

It is possible that the ITT model did not receive as much support as other specific models because of positively skewed distributions of three (out of four) ITT threat variables. Participants tended to report low levels of realistic threat, symbolic threat and negative stereotype. For realistic threat, over 30% of participants reported the lowest score possible, and this highly skewed variable was omitted from the analyses. The pattern of extremely low values of threat perceptions may be due to sample characteristics, as only undergraduate students were recruited. Past studies with North American undergraduate samples have reported low values of ITT threats as well (e.g. Charles-Toussaint & Crowson, 2010).

Across the mediation and moderated mediation models in Study 1 and 2, SDO emerged as the stronger predictor of prejudice towards vegans compared to RWA. These findings suggest that attitudes towards vegans may be more strongly associated with ideologies concerning maintaining group hierarchies and ingroup dominance (i.e. SDO; Pratto et al., 1994; Sidanius & Pratto, 2001) than a belief in abiding by social and cultural norms around diet and lifestyle (i.e. RWA, Altemeyer, 1981). This inference aligns with the suggestion of Dhont et al. (2014) that being higher on SDO is connected to both pro-exploitation attitudes towards animals and

outgroup prejudice through group dominance beliefs. And, as discussed before, vegans may be seen as challenging human superiority beliefs by those higher in SDO (see Judge & Wilson, 2018). Future research might assess the degree to which beliefs in human superiority over animals explain the effects of SDO on attitudes towards vegans, and perhaps compare these indirect effects to those of veganism threat (given that it has also been found to explain the effects of SDO on attitudes towards vegans, for e.g., MacInnis & Hodson, 2017).

### **Imagined Contact and Diet-Based Prejudice**

Another goal of the present thesis was to explore mechanisms for prejudice-reduction. The effect of imagined contact on attitudes towards vegan was investigated, as past research has demonstrated that imagined contact with outgroups can promote tolerant attitudes, especially in a positive context (Miles & Crisp, 2014; Stathi & Crisp, 2008). Ideology and threat were also examined. Generally, imagined contact was not associated with threat. This is inconsistent with previous research showing a link between imagined contact and reduced outgroup anxiety (e.g., Stathi & Crisp, 2008).

In Study 2, people who imagined interactions with vegans had significantly more favourable attitudes towards vegans compared to those in the control condition, replicating previous research (Crisp & Turner, 2009; Stathi & Crisp, 2008; Turner et al., 2007). However, unlike some previous studies (Vezzali et al., 2012), those who imagined having contact with vegans did not have more positive behavioural intentions towards the outgroup. Since the average age of participants was 19.60 and more than half of vegans and vegetarians in Canada are under the age of 35 (see Thomson, 2018), it is reasonable to assume that many of the participants may have friends, family or acquaintances who are vegan, or who interact with vegans. Participant responses from the level of contact scale in Study 2 are consistent with this

assumption: 70% of participants from this sample had at least 1 vegan friend, 43.7% participants spent at least some time regularly with their vegan friends, and more than half (53.7%) reported moderate to expert knowledge of vegans.

It is possible that this prior familiarity may be associated with positive attitudes and intentions towards vegans, consistent with research on direct contact (Pettigrew & Tropp, 2008) and extended contact (Turner et al., 2007; Wright et al., 1997). However, participants may have already reached a “ceiling effect” in terms of contact increasing their positive behavioural intentions towards vegans. This would explain the paucity of an observed association between imagined contact and behavioural intentions towards vegans in the Study 2 of the present thesis.

Two moderated mediation models were examined to understand the role of threat in explaining the relationship between imagined contact and attitudes towards vegans. The moderated mediation models revealed that reduced threat perceptions did not account for the association between imagining contact with vegans and more favourable attitudes towards them. This is not surprising given that none of the threat types were affected by the imagined contact manipulation. These findings are unlike previous research on the mediating effects of intergroup anxiety (e.g., Husnu & Crisp, 2010; Stathi & Crisp, 2008) and symbolic threat (e.g., Ramiah & Hewstone, 2013).

Generally, the multiple moderated mediation model results indicated some evidence of a moderating role of ideology on the association between imagined contact and outgroup threat perceptions. RWA and SDO moderated the impact of imagined contact on stereotype threat perceptions, such that for those who were lower on RWA and higher on SDO, imagining interactions with vegans was linked to higher endorsement of negative stereotypes. SDO was also found to moderate the relationship between veganism threat and attitudes towards vegans,

such that for those lower on SDO or having average values of SDO, higher perceptions of veganism threat were associated with more positive attitudes towards vegans. The findings for RWA, but not SDO, are consistent with previous studies (Asbrock et al., 2012). Further, the nature of associations between imagined contact and negative stereotypes, and veganism threat and attitudes towards vegans are in the opposite direction of what was expected. As discussed above, imagined contact is usually associated with lower threat perceptions (for e.g., see Stathi & Crisp, 2008). And lower (vs. higher) threat perceptions have been found to be associated with favourable outgroup attitudes (for e.g., see Husnu & Crisp, 2010). Finally, there are several possible reasons for the lack of observed moderation and mediation effects (of ideology and threat respectively).

One possible reason is the impact of skewed ideology and threat variables on the moderation and mediation pathways. Realistic threat was highly positively skewed, with high frequency of low threat values reported by participants. RWA and negative stereotype had non-normal distributions, with relatively higher frequencies of higher values. The outliers had to be winsorized to reduce the skewness of their distributions. In particular, the unexpected nature of association between imagined contact and negative stereotypes mentioned above, may be due to the skewed distribution of the negative stereotype variable in Study 2. Additionally, the findings of the moderated mediation models should be interpreted with caution, given the low power of the research design. Previous work using multiple moderated mediation found that a sample size of around 600 is required to have sufficient statistical power and a medium effect size (Zhang, 2014). In study 2 only data from 106 participants was analyzed, and thus it was underpowered for assessing interactions (moderation) and mediation.

The role of low reliability of some measures, especially the group dominance ( $\alpha = .42$ ) and social threat ( $\alpha = .42$ ) scales cannot be ruled out either. The low reliability for these two modified scales is inconsistent with previous studies that used these scales (Charlesford & Choma, 2013; Choma et al., 2016) and found the reliability values to be significantly higher ( $\alpha > .70$ ). In retrospect, some of the items for these scales did not seem suitable for capturing threat perceptions towards vegans, and this could have lead to the lower internal consistency observed in the present thesis. For instance, items such as: “I hate when vegans are portrayed as inferior”, from the group dominance scale and “Vegans are a threat to Canadian society”, from the social threat scale, were perhaps more relevant for studying threats perceived from other outgroups (e.g. religious outgroups; Choma et al., 2016).

Future studies should aim for a much larger sample sizes, given the low power of the current study for moderated mediation analyses. They should also only use the veganism threat scale and the ITT threat scales (negative stereotypes, intergroup anxiety and realistic threat), for capturing threats specific to vegan and vegetarian lifestyles. These scales have been found to have high reliability ( $\alpha > .70$ ), in the current thesis and past research (MacInnis & Hodson, 2017).

Lastly, the undergraduate sample in Study 2 of the present thesis was low on right-wing ideologies and threat perceptions (with the exception of social threat for which they scored moderately high). Given this, and that past research that provides evidence of liberal attitudes and low right-wing beliefs in post-secondary students (Magdol, 2003; McFarland, 2005), the potential moderating and mediating effects on the relationship between imagined contact on prejudice towards vegans needs to be explored more with non-student, community samples that may be higher on right wing ideology and threat perceptions.

In terms of future directions, researchers can consider exploring moderated mediation models to understand the effects of imagined contact on attitudes towards vegans, with ingroup identification as a moderator, and group-oriented threats (such as symbolic threat) as mediators. Past research (Ramiah & Hewstone, 2013; Stathi & Crisp, 2008) exploring the effect of imagined contact on threat, suggests imagined contact is not only associated with individual-oriented threat perceptions (like intergroup anxiety) but also group-oriented perceptions (like symbolic threat). As suggested by Ramiah and Hewstone (2013), the mediation effect of the symbolic threat type may be moderated by ingroup identification, with the relation between imagining outgroup contact and lower symbolic threat perceptions only being observed if the perceiver strongly identifies with their ingroup.

### **Utility of Threat Models for Understanding Prejudice**

The findings from the threat mediation models in the present thesis bring up a broader question: the utility of specific threat mediation models over more general, overarching ones. In other words, whether using individual models such as the DPM (Duckitt, 2001; Duckitt & Sibley, 2009) and the ITT (Stephan & Stephan, 1996, 2000), is better than using a latent threat model, to understand relationships between ideology and prejudice towards vegans. Although both DPM and ITT explain the relationship between ideology and outgroup attitudes (Costello & Hodson, 2011; Duckitt, 2006), each model has their unique advantages. Unlike the ITT, the postulates of the DPM explicitly incorporate the role of personal differences and social context in their model and conceptually tie certain threat types to be associated with RWA (social threat) and SDO (group dominance) respectively (Duckitt, 2001; Duckitt & Sibley, 2009). DPM-inspired models outline two pathways for understanding the unique threat mechanisms that can lead to the same outcome (outgroup prejudice) in those high on RWA and SDO.

On the other hand, ITT outlines four unique threat types that are associated to prejudice (Stephan & Stephan, 1996,2000) and can mediate the relationship between ideology and threat. Two of these threat types are unique to ITT: stereotype threat and intergroup anxiety and deal with individual-oriented threats as opposed to the group-oriented threats outlined in the DPM (see Ramiah & Hewstone, 2013). Intergroup anxiety in particular, has found to consistently uniquely explain the effects of ideology on intergroup attitudes (Costello & Hodson, 2011).

Additionally, it is worth noting that a unique threat not part of the above mentioned models, veganism threat (Dhont & Hodson, 2014), has also been linked to prejudice and found to explain the relationship between ideology and attitudes towards vegans (Dhont et al., 2016; MacInnis & Hodson, 2017).

Similar to the research cited above, one or more threats from all three models (DPM, ITT and veganism threat) were related to prejudice towards vegans, and explained the relationship between ideology and attitudes towards vegan outgroups, in Study 1 of the present thesis. Further, only weak to moderate correlations were observed amongst these threats. Taken together, these findings signify the utility of threats from all three models in predicting prejudice, especially their ability to explain unique variance in attitudes towards vegans.

Generally, most threats showed the same pattern: negative relations with outgroup attitudes. And therefore, a general threat model might be sufficient for understanding the relationship between threat and outgroup prejudice, especially towards vegans. Running a latent threat model that explores generalized threat, rather than testing individual models with specific threats, may be a more suitable and efficient way of understanding the associations and higher-order relationships between ideology, threat and prejudice towards vegans.

## **Limitations and Future Directions**

It is important to note the limitations of the present thesis, and mention future directions research could explore to further understanding of prejudice towards vegans and interventions to reduce these negative intergroup attitudes (in addition to those already discussed). First, both samples were comprised of only undergraduate students. Consistent with findings of previous research with North American university students (Dunwoody & McFarland, 2017; McFarland, 2005), relatively low average scores of RWA and SDO were observed (less than 3.5 on a 7-point rating scale for RWA, and less than 3.0 on a 7-point rating scale for SDO). Therefore, it is possible that some of the relationships between ideology, threat and prejudice towards vegans may play out differently in a non-student sample that is more representative of the general population in an urban, North American setting. Future research can explore that, preferably with non-student community samples, similar to the work of MacInnis and Hodson (2017), who used MTurk samples of mostly non-students.

Second, most of the participants in both studies of the present thesis were female (83.7% in Study 1 and 82.5% in Study 2). Gender is important because it might predict prejudice toward vegans. Previous research with a more even gender distribution suggests that omnivore women may rate vegan and vegetarian male targets more positively, compared to omnivore men (MacInnis & Hodson, 2017). Since the target individual (JS) was male in Study 1 of the current thesis, it is possible that the female participants rated him more positively in the vegan/vegetarian conditions than the male participants. And this influenced the overall ratings of vegans in this female-majority sample. The target may be rated less favourably with a more representative sample.



Third, participants in both samples were considerably younger compared to the general adult population in Canada. Their average age in both samples was less than 20 years compared to the average age in Canada: 41 years (Statistics Canada, 2018). As mentioned previously, more than half of Canadian vegans and vegetarians are under the age of 35 (Thomson, 2018). So younger people are more likely to know vegans in their social circle and be familiar with vegan diets and lifestyles. Future research should investigate attitudes towards vegans with a sample that has a more representative age distribution. It would also be interesting to study the effect of imagined contact on attitudes and behavioural intentions towards vegans in such a sample, as they seem to have less favourable attitudes and intentions at baseline (compared to younger samples).

Additionally, the samples used in the current thesis also had some desirable characteristics from a social scientific research perspective. Sampling from the student population at Ryerson University in Toronto, Canada, enabled me to recruit samples that were ethnically and religiously very diverse, and representative of the general population in Toronto (Statistics Canada, 2017). More than half of the participants in both samples identified as ethnic and religious minorities. Therefore, the findings from the present thesis were more generalizable than some other studies on attitudes towards vegans that had more ethnically homogenous samples (Judge & Wilson, 2018; MacInnis & Hodson, 2017).

A major limitation of all mediation models in Study 1 of the present thesis was that causation cannot be inferred. This is because the data was cross-sectional (collected all at once), and such a design cannot provide evidence for the causal order of the variables in a model. Experimental or longitudinal data are needed to evaluate whether ideology leads to threat and in turn prejudice. It is worth noting that the ordering of these constructs, and the predictions for the

mediation pathways were in line with existing theory (DPM: Duckitt, 2001; Duckitt & Sibley, 2009; ITT: Stephan & Stephan, 2000) and previous research (Costello & Hodson, 2011; MacInnis & Hodson, 2017; McFarland, 2005). Nevertheless, this causal order could theoretically be reversed. Indeed, threat has been conceptualised as a cause and consequence of ideology. For instance, in Jost's theory of political conservatism as motivated social cognition (Jost, Glaser, Kruglanski, & Sulloway, 2003) and related research (Janoff-Bulman, 2009; Onraet, Dhont, & Van Hiel, 2014), threat is theorised to predict ideology. Theory and research on the two different causal orders for ideology and threat may suggest that the causality is bi-directional (see Choma & Hodson, 2017; Jost, Noorbaloochi, & Van Bavel, 2014). In the context of understanding prejudice towards vegans, it is possible that viewing outgroups as threatening in general predicts ideological beliefs of perceivers. And this ideology in turn predicts prejudice towards vegans. Longitudinal research or experimental work that explores the relationships between ideology and its underpinnings, and threat and prejudice towards vegans, could inform this question further.

Finally, manipulating the diet-based and religious identity of the target individual in Study 1, had pros and cons. On the plus side, experimental manipulation of the target's identity allowed me to assess whether certain diet-based and religious identities predict less favourable target evaluations than others, as opposed to merely measuring the correlations between target identity and their evaluations. However, the manipulation may have been too subtle to elicit a negative response to the target's salient identities, as suggested by the relatively favourable ratings of the target across all four conditions of the manipulation (over 70 on a 100-point rating scale).

Participants read a brief passage about the target, that only provided them with some information about what the target likes to do and made salient their diet-based and religious

identities. It did not provide visual cues such as pictures of the target (e.g. a turban wearing man for the Sikh conditions), or details about the religious and diet-related beliefs of the target (e.g. the motivation for choosing one's diet in the vegan/vegetarian conditions). These could have more strongly cued the outgroup identities of the Sikh and/or vegan/vegetarian targets to the participants and lead to relatively more negative target evaluations. Previous research has found that if target pictures make outgroup identities (e.g., religion and ethnicity) salient, then perceivers are much more likely to evaluate targets negatively (Brown, Ali, Stone & Jewell, 2017).

## Conclusion

The present thesis explored diet-based prejudice in a Canadian context. Preliminary social psychological research has provided evidence for the existence of prejudice towards vegans and vegetarians (Judge & Wilson, 2018; MacInnis & Hodson, 2017; Minson & Monin, 2012). Across both studies, findings demonstrate that right-wing ideology as well threat perceptions predict attitudes towards vegans, and help understand why some people hold favourable (vs. unfavourable) attitudes towards this outgroup. Additionally, Study 1 did not find evidence for a possible buffering effect of religious affiliation of vegans on attitudes towards them, and future research needs to assess this further. Finally, imagined contact, a bias-reduction intervention explored in Study 2 showed some promise for fostering positive attitudes towards vegans, as it was found to be associated with more favourable attitudes towards vegans, compared to the control condition. The present thesis represents the first instance of studying imagined contact with the purpose of attenuating prejudice towards a diet-based outgroup (vegans). Vegan and vegetarian diets are on the rise (as discussed in MacInnis & Hodson, 2017) and there is a corresponding increase in anti-vegan sentiment (MacInnis & Hodson, 2017; Morgan & Cole, 2011). Given this, the current findings add to the nascent literature on prejudice towards vegans. They provide a good starting point to examine whether this pattern of negative attitudes changes with the increasing endorsement of vegan diets and lifestyles, or if it ends up mirroring the trend of “anti-fat” prejudice that is pervasive, despite a majority of the adult population in many western nations being classified as overweight or with obesity (Daníelsdóttir, O'Brien, & Ciao, 2010).

## Appendix A

### Demographic information (Study 1 and 2)

1. Please indicate your gender by checking one of the boxes: Male ☐ Female ☐ Other ☐
2. Please state your age: \_\_\_\_\_
3. Please indicate your ethnic background by checking all that apply.
  - ☐ White/Caucasian
  - ☐ Black
  - ☐ South Asian
  - ☐ Chinese
  - ☐ Korean
  - ☐ Japanese
  - ☐ Southeast Asian
  - ☐ Filipino
  - ☐ Arab/West Asian
  - ☐ Latin American
  - ☐ Other, please specify: \_\_\_\_\_
4. What is the highest level of education that you have completed?
  - ☐ Less than high school graduate
  - ☐ High school graduate
  - ☐ Some college or university
  - ☐ Completed college or university (Bachelor's Degree)
  - ☐ Master's degree
  - ☐ Doctoral degree
5. Please indicate your religious affiliation:
  - ☐ Buddhist
  - ☐ Hindu
  - ☐ Christian

- ☐ Muslim
- ☐ Sikh
- ☐ Jewish
- ☐ Atheist
- ☐ Other, please specify: \_\_\_\_\_

6. Please indicate your dietary preferences:

- ☐ Vegetarian (including ovo-vegetarian and lacto-vegetarian)
- ☐ Omnivore (including pescetarian)
- ☐ Vegan (plant-based)

## Appendix B

### RWA Scale (Altemeyer, 2006)

(Study 1 and 2)

Please select your response, using the scale below.

<b>Very Strongly Disagree</b>	<b>-4</b>	<b>-3</b>	<b>-2</b>	<b>-1</b>	<b>0</b> <b>Neither Agree Nor Disagree</b>	<b>+1</b>	<b>+2</b>	<b>+3</b>	<b>+4</b> <b>Very Strongly Agree</b>
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- \_\_\_ 1. The established authorities generally turn out to be right about things, while the radicals and protestors are usually just “loud mouths” showing off their ignorance.
- \_\_\_ 2. Women should have to promise to obey their husbands when they get married.
- \_\_\_ 3. Our country desperately needs a mighty leader who will do what has to be done to destroy the radical new ways and sinfulness that are ruining us.
- \_\_\_ 4. Gays and lesbians are just as healthy and moral as anybody else.
- \_\_\_ 5. It is always better to trust the judgment of the proper authorities in government and religion than to listen to the noisy rabble-rousers in our society who are trying to create doubt in people’s minds.
- \_\_\_ 6. Atheists and others who have rebelled against the established religions are no doubt every bit as good and virtuous as those who attend church regularly.
- \_\_\_ 7. The only way our country can get through the crisis ahead is to get back to our traditional values, put some tough leaders in power, and silence the troublemakers spreading bad ideas.
- \_\_\_ 8. There is absolutely nothing wrong with nudist camps.

- \_\_\_ 9. Our country needs free thinkers who have the courage to defy traditional ways, even if this upsets many people.
- \_\_\_ 10. Our country will be destroyed someday if we do not smash the perversions eating away at our moral fiber and traditional beliefs.
- \_\_\_ 11. Everyone should have their own lifestyle, religious beliefs, and sexual preferences, even if it makes them different from everyone else.
- \_\_\_ 12. The “old-fashioned ways” and the “old-fashioned values” still show the best way to live.
- \_\_\_ 13. You have to admire those who challenged the law and the majority’s view by protesting for women’s abortion rights, for animal rights, or to abolish school prayer.
- \_\_\_ 14. What our country really needs is a strong, determined leader who will crush evil, and take us back to our true path.
- \_\_\_ 15. Some of the best people in our country are those who are challenging our government, criticizing religion, and ignoring the “normal way things are supposed to be done.”
- \_\_\_ 16. God’s laws about abortion, pornography and marriage must be strictly followed before it is too late, and those who break them must be strongly punished.
- \_\_\_ 17. There are many radical, immoral people in our country today, who are trying to ruin it for their own godless purposes, whom the authorities should put out of action.
- \_\_\_ 18. A “woman’s place” should be wherever she wants to be. The days when women are submissive to their husbands and social conventions belong strictly in the past.
- \_\_\_ 19. Our country will be great if we honor the ways of our forefathers, do what the authorities tell us to do, and get rid of the “rotten apples” who are ruining everything.



\_\_\_ 20. There is no “ONE right way” to live life; everybody has to create their own way.

\_\_\_ 21. Homosexuals and feminists should be praised for being brave enough to defy “traditional family values.

\_\_\_ 22. This country would work a lot better if certain groups of troublemakers would just shut up and accept their group’s traditional place in society.

## Appendix C

### SDO<sub>7</sub> Scale (Ho et al., 2015)

(Study 1 and 2)

Show how much you favour or oppose each idea below by selecting a number from 1 (STRONGLY OPPOSE) to 7 (STRONGLY FAVOUR) on the scale below. You can work quickly; your first feeling is generally best.

<b>Strongly Oppose</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>Strongly Favour</b>
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1. Some groups of people must be kept in their place.
2. It's probably a good thing that certain groups are at the top and other groups are at the bottom.
3. An ideal society requires some groups to be on top and others to be on the bottom.
4. Some groups of people are simply inferior to other groups.
5. Groups at the bottom are just as deserving as groups at the top.
6. No one group should dominate in society.
7. Groups at the bottom should not have to stay in their place.
8. Group dominance is a poor principle.
9. We should not push for group equality.
10. We shouldn't try to guarantee that every group has the same quality of life.
11. It is unjust to try to make groups equal.
12. Group equality should not be our primary goal.
13. We should work to give all groups an equal chance to succeed.
14. We should do what we can to equalize conditions for different groups.

15. No matter how much effort it takes, we ought to strive to ensure that all groups have the same chance in life.
16. Group equality should be our ideal.

## Appendix D

### Intergroup Anxiety (Stephan & Stephan, 1985)

(Study 1 and 2)

If you were in contact with\_\_\_\_, would you feel...

	Not at all				Extremely		
	-3	-2	-1	0	+1	+2	+3
a) ... <u>awkward</u>	-3	-2	-1	0	+1	+2	+3
b) ... <u>self-conscious</u>	-3	-2	-1	0	+1	+2	+3
c) ... <u>happy</u>	-3	-2	-1	0	+1	+2	+3
d) ... <u>accepted</u>	-3	-2	-1	0	+1	+2	+3
e) ... <u>confident</u>	-3	-2	-1	0	+1	+2	+3
f) ... <u>irritated</u>	-3	-2	-1	0	+1	+2	+3
g) ... <u>impatient</u>	-3	-2	-1	0	+1	+2	+3
h) ... <u>defensive</u>	-3	-2	-1	0	+1	+2	+3
i) ... <u>suspicious</u>	-3	-2	-1	0	+1	+2	+3
j) ... <u>careful</u>	-3	-2	-1	0	+1	+2	+3

## Appendix E

Realistic Threat (Stephan et al., 1999; Stephan et al., 2000; Kervyn, Fiske, & Yzerbyt, 2015)

(Study 1 and 2)

We are interested in your opinions about\_\_\_\_. Please indicate the degree to which you agree or disagree with each of the statements below, using the following scale:

**Not at All      1      2      3      4      5      6      7      To a Great Extent**

1. [Insert group name] dominate Canadian society more than they should.
2. The financial success of [insert group name] owned businesses has come at the cost of other Canadian businesses.
3. [Insert group name] have too much political power.

## Appendix F

Symbolic Threat (Brandt et al., 2015; Stephan et al., 2000; Kervyn, Fiske, & Yzerbyt, 2015)

(Study 1 and 2)

We are interested in your opinions about \_\_\_\_\_. Please indicate the degree to which you agree or disagree with each of the statements below, using the following scale:

**Not at All      1      2      3      4      5      6      7      To a Great Extent**

1. To what extent do you think the following groups violate your cultural norms and beliefs?
2. To what extent do you think the following groups reject moral values that are important to you?
3. The following groups should have to accept conventional Canadian ways of living
4. The following group (s) and other Canadians have very few incompatible values

**(Reverse Scored)**

## Appendix G

Vegetarianism/Veganism Threat (Dhont & Hodson, 2014; MacInnis & Hodson, 2017)

(Study 1 and 2)

Items of vegetarianism threat and human supremacy beliefs (1 = strongly disagree to 5 = strongly agree).

1. The rise of vegetarianism poses a threat to our country's cultural customs.
2. Important culinary traditions which are typical to our country are starting to die out due to the rise of vegetarianism.
3. Eating meat is part of our cultural habits and identity and some people should be more respectful of that.
4. Vegetarians should have more respect for our traditional eating customs, which meat consumption is simply part of.
5. Important family traditions and celebrations are increasingly being ruined and disappearing because of the presence of vegetarians in certain families.
6. Vegetarianism has a negative influence on the economy.
7. The vegetarian movement is too involved in local and national politics.
8. Nowadays, when it comes to nutrition and meals, people listen too much to what a minority of vegetarians wants.
9. Vegetarians/vegans think they are better than meat eaters.
10. Vegetarians/vegans are spreading misinformation about the animal agriculture industry in Canada
11. The recent Health Canada recommendations to consume less meat and dairy and more plant-based protein sources are due to the aggressive lobbying of vegetarians/vegans

## Appendix H

### Negative Stereotypes (Stephan et al., 1993)

(Study 1 and 2)

Please estimate and select the percentage of \_\_\_\_\_ who possess each of the following traits:

<b>Talented</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<b>Competitive</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<b>Smart</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<b>Friendly</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<b>Competent</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<b>Strong-willed</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<b>Attention-Seeking</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<b>Manipulative</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<b>Antisocial</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<b>Annoying</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<b>Unattractive</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<b>Self-righteous</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<b>Preachy</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<b>Radical</b>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Please rate how favourable each of the following traits are on a scale from 1 (VERY FAVOURABLE) to 10 (VERY UNFAVOURABLE):

**Not at All      1      2      3      4      5      6      7      8      9      10      Extremely**

1. Talented
2. Competitive
3. Smart
4. Friendly
5. Competent



6. Strong-willed
7. Attention-Seeking
8. Manipulative
9. Antisocial
10. Annoying
11. Unattractive
12. Self-righteous
13. Preachy
14. Radical

## Appendix I

Group Dominance Threat (Charlesford & Choma, 2013; Choma et al., 2016)

(Study 1 and 2)

Please indicate the degree to which you agree or disagree with each of the statements below, using the following scale:

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Disagree Somewhat</b>	<b>Neutral</b>	<b>Agree Somewhat</b>	<b>Agree</b>	<b>Strongly Agree</b>

1. I hate when members of this group are portrayed as inferior.
2. I would like to see [insert group name] respected.
3. I fear that the general public is not tolerant enough of members of this group.
4. The time and effort spent on pandering to [insert group name] would be better spent on other issues.

## Appendix J

Social Threat (Charlesford & Choma, 2013; Choma et al., 2016)

(Study 1 and 2)

Please indicate the degree to which you agree or disagree with each of the statements below, using the following scale:

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Disagree Somewhat</b>	<b>Neutral</b>	<b>Agree Somewhat</b>	<b>Agree</b>	<b>Strongly Agree</b>

1. [insert group name] are a threat to Canadian society.
2. It is clear that the welfare of the general public is threatened by [insert group name].
3. [insert group name] undermine traditional Canadian culture.
4. Canadians shouldn't be threatened by [insert group name].

## Appendix K

### Attitude Thermometers (Haddock, Zanna, & Esses, 1993)

#### (Study 1)

Please indicate your overall evaluation of the assigned target individual, between 0 (extremely unfavourable) to 100 (extremely favourable)

Vegan or Vegetarian Sikh

Omnivore Sikh

Omnivore Christian

Vegan or Vegetarian Christian

Please indicate your overall evaluation of the following groups, between 0 (extremely unfavourable) to 100 (extremely favourable)

Sikhs

Christians

Vegans and Vegetarians

Omnivores

Omnivore Christians

Omnivore Sikhs

Vegan/vegetarian Sikhs

Vegan/vegetarian Christians

### Attitude Thermometers (Haddock, Zanna, & Esses, 1993)

#### (Study 2)

Please indicate your overall evaluation of the target individual, between 0 (extremely unfavourable) to 100 (extremely favourable)

JS

Please indicate your overall evaluation of the following groups, between 0 (extremely unfavourable) to 100 (extremely favourable)

Vegans

Vegetarians

Omnivores

Gluten-free diet

Plant-based diet

## Appendix L

### Open-Ended Response Task (Esses et al., 1993)

#### (Study 1)

List up to 10 emotions you experience when thinking about the target group assigned to you.

Also list up to 10 characteristics you think members of this target group possess.

Omnivore Sikhs

Vegan/vegetarian Sikhs (religious reasons)

Vegan/vegetarian Sikhs (non-religious reasons)

Vegan/vegetarian Christians

Omnivore Christians

## Appendix M

### Opinion on Vegans and Vegetarians

#### (Study 1)

We are also interested in learning more about peoples' thoughts about vegans and vegetarians. Please share any thoughts about your experiences with members of this group and what you think of them:

#### (Study 2)

We are also interested in learning more about peoples' thoughts about vegans. Please share any thoughts about your experiences with members of this group and what you think of them:

## Appendix N

### Level of Contact Scale (Zafar & Ross, 2015)

(Study 2)

1. Please indicate the *number of friends* you have that are vegans: \_\_\_\_\_.
2. How many *hours per week* do you spend interacting with vegans? \_\_\_\_\_.
3. How often do you have personal contact with vegan people?

Never	Occasionally	Sometimes	Quite a lot	All the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. How often do you spend time with vegan friends?

<b>Never</b>	<b>Occasionally</b>	<b>Sometimes</b>	<b>Quite a lot</b>	<b>All the time</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. For the last item, indicate the extent of your knowledge about vegans using the following scale:

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>None</b>	<b>Minimal</b>	<b>Basic</b>	<b>Moderate</b>	<b>Large</b>	<b>Extensive</b>	<b>Expert</b>



## Appendix O

### Regression Analyses with Ideology, Religion and Diet

(Study 1)

Table 3.1

*Regression model analyzing the effects of ideology, religion and diet on attitude ratings for the target individual, vegans and Sikh vegans/vegetarians in Study 1*

Predictor	J.S	Vegans	Sikh vegans/vegetarians
Target Religion	0.25* [.03, .46]	0.07 [-.15, .28]	0.17 [-.06, .34]
Target Diet	-0.00 [.84, -.23]	-0.03 [-.24, .18]	.06 [-.14, .28]
RWA	0.09 [-.14, .13]	0.00 [-.12, .13]	-0.11 [-.19, .06]
SDO	-0.06* [-.25, -.00]	-0.24*** [-.36, -.12]	-0.23*** [-.31, -.10]
R <sup>2</sup>	0.03	0.06	0.08

Note. Unstandardized variables are shown.  $N=330$ . \* $p<.05$ . \*\* $p<.01$ . \*\*\* $p<.001$

Table 3.2

*Regression model analyzing the effects of ideology, religion, diet and their interactions on attitude ratings for the target individual, vegans and Sikh vegans/vegetarians in Study 1*

Predictor	J.S	Vegans	Sikh vegans/vegetarians
Target Religion	0.21 [-0.03,0.45]	0.02 [-0.22,0.26]	0.11 [-0.13,0.34]
Target Diet	0.02 [-0.23,0.26]	-0.03 [-0.28,0.21]	0.07 [-0.16,0.31]
RWA	0.17 [-0.09,0.43]	0.02 [-0.24,0.29]	0.01 [-0.25,0.26]
SDO	-0.11 [-0.41,0.18]	-0.18 [-0.47,0.12]	-0.30* [-0.59,-0.02]
RWA x SDO	-0.11 [-0.35,0.14]	-0.19 [-0.43,0.05]	-0.19 [-0.42,0.05]
RWA x Religion	-0.26 [-0.63,0.11]	-0.02 [-0.38,0.35]	-0.15 [-0.51,0.2]
RWA x Diet	-0.18 [-0.54,0.18]	-0.28 [-0.64,0.07]	-0.29 [-0.64,0.06]
SDO x Religion	0.01 [-0.38,0.39]	-0.07 [-0.45,0.31]	0.18 [-0.19,0.55]
SDO x Diet	0.06 [-0.32,0.43]	-0.01 [-0.38,0.36]	0.11 [-0.25,0.48]
RWA x SDO x Religion	0.00 [-0.32,0.32]	0.08 [-0.24,0.39]	0.06 [-0.25,0.37]

RWA x SDO x Diet	-0.16 [-0.48,0.17]	-0.09 [-0.41,0.23]	-0.15 [-0.46,0.16]
RWA x Religion x Diet	0.34 [-0.17,0.85]	0.42 [-0.09,0.93]	0.49 [-0.01,0.99]
SDO x Religion x Diet	-0.16 [-0.68,0.36]	-0.03 [-0.55,0.48]	-0.24 [-0.75,0.26]
RWA x SDO x Religion x Diet	0.21 [-0.18,0.6]	0.18 [-0.21,0.57]	0.23 [-0.16,0.61]
R <sup>2</sup>	0.05	0.10	0.12

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Note. Unstandardized variables are shown. *N*=330. \**p*<.05. \*\**p*<.01. \*\*\**p*<.001

## Appendix P

### **DPM, ITT and Veganism Threat Mediation Models**

Path analyses were conducted for the DPM inspired, ITT inspired and veganism threat mediation models. This was done using AMOS software, based on maximum likelihood procedure and bias-corrected estimates for direct and indirect effects derived from bootstrapping using 1000 samples. We tested fully saturated models ( $df=0$ ), therefore no fit indices are reported. Tables 3.3, 3.4, and 3.5 summarize the direct and indirect effects for the DPM-inspired, ITT-inspired, and veganism threat models respectively.

**DPM model (Hypothesis 3a).** For the DPM-inspired model, RWA and SDO both had significant direct effects on social threat, as predicted. SDO also had a significant direct effect on group dominance threat. Together, RWA and SDO explained 6% and 14% of the variance in group dominance threat and social threat, respectively. SDO had significant direct effects on attitudes towards vegans and Sikh vegans/vegetarians. Social threat showed significant direct effects on attitudes towards JS and Sikh vegans/vegetarians, whereas group dominance threat only demonstrated significant direct effect on attitudes towards JS. Ideology and threat jointly accounted for 5%, 7% and 8% of the variance in attitudes towards JS, vegans and Sikh vegans/vegetarians respectively. The direct paths from RWA to attitudes towards outgroups, and both SDO and RWA to attitudes towards JS, were not significant.

The indirect effects of RWA and SDO on attitudes towards JS and Sikh vegans/vegetarians via threat were significant. The indirect effects of both ideology variables on attitudes towards vegans however, were not significant. Therefore, the proposed model and hypothesis 3a were partially supported, with the data providing evidence for pathways from both RWA and SDO predicting attitudes towards JS and Sikh vegans/vegetarians.

Table 3.3

*Standardized direct and indirect effects of ideology, DPM threats, on attitude ratings for the target individual, vegans and Sikh vegans/vegetarians in Study 1*

IV	Effects	Criteria				
		DOM	SOC	JS	Vegans	Sikh vegans/vegetarians
RWA <sup>1</sup>	Direct	.06 [-.06, .20]	.15** [.25, .74]	.09[-.03, .20]	.02[-.10, .13]	-.03[-.15, .11]
SDO <sup>1</sup>	Direct	.20** [.08, .32]	.26**[.18, .44]	-.04[-.21, .11]	-.28**[-.37, -.12]	-.19**[-.34, -.07]
DOM	Direct			-2.83**[-.26, -.04]	-.07[-.19, .07]	-.02[-.14, .09]
SOC	Direct			-2.67**[-.26, -.00]	-.05[-.18, .06]	-.12**[-.23, -.02]
RWA <sup>1</sup>	Indirect			-.03**[-.07, -.00]	-.03[-.05, .01]	-.02**[-.05, .00]
SDO <sup>1</sup>	Indirect			-.07**[-.10, -.03]	-.03[-.06, .01]	-.04**[-.08, -.01]
R <sup>2</sup>		.06	.14	.05	.07	.08

Note. N = 327. \*\* indicates the path is significant at  $p < .01$ , \* indicates the path is significant at  $p < .05$ . RWA = right-wing authoritarianism; SDO = social dominance orientation; DOM = group dominance threat; SOC = social threat; JS= Attitude ratings of target, Vegans= Attitude ratings of vegans, Sikh vegans/vegetarians=Attitude ratings of Sikh vegans/vegetarians. RWA and SDO were correlated in this model.  $r = .526$ ,  $p < .05$ .

**ITT model (Hypothesis 3b).** For the ITT-inspired model, RWA and SDO each had significant direct effects on stereotype threat and intergroup anxiety, respectively. RWA and SDO together accounted for 2%, 8%, and 2% of the variance in intergroup anxiety, stereotype threat and symbolic threat, respectively. Only intergroup anxiety had significant direct effects on attitudes towards JS, whereas SDO, stereotype threat and intergroup anxiety all had significant direct effects on attitudes towards vegans. SDO and intergroup anxiety also showed direct significant effects on attitudes towards Sikh vegans/vegetarians. Ideology and threat variables together explained 5%, 15% and 18% variance in attitudes towards JS, vegans and Sikh vegans/vegetarians respectively. Notably, the direct pathway between stereotype threat and attitudes towards vegans was in the opposite direction than anticipated, such that greater stereotype threat perceptions predicted more positive attitudes towards vegans. These effects were very small, however (see Table 3.4 for values).

No indirect effects of ideology on attitudes towards JS, vegans and Sikh vegans/vegetarians were observed. Therefore, the ITT-inspired model did not find evidence for the proposed hypothesis (3b).

Table 3.4

*Standardized direct and indirect effects of ideology, ITT threat on attitude ratings for the target individual, vegans and Sikh vegans/vegetarians in Study 1*

IV	Effects	Criteria					
		ANX	STE	SYM	JS	Vegans	Sikh vegans/vegetarians
RWA <sup>1</sup>	Direct	-.01 [-.13, .10]	.22** [.09, .29]	.05 [-.09, .17]	.05 [-6.51, 1.67]	-.01[-.12, .11]	-.08[-.19, .05]
SDO <sup>1</sup>	Direct	.13**[.01,.28]	.10[-.02, .23]	.09[-.03, .24]	.05[-.27, .04]	-.23**[-.34, -.10]	-.19**[-.32,-.07]
ANX	Direct				-.19** [-.33,-.07]	-.27**[-.38, -.17]	-.32**[-.43, .00]
STE	Direct				-.00 [-.11,.10]	.11**[.00, .21]	.096[-.00, .21]
SYM	Direct				.11,.10]	-.03 [-.14, .06]	-.02[-.15, .09]
RWA <sup>1</sup>	Indirect				.02 [-.09, .12]	.02 [-.02, .07]	.02 [-.02, .08]
SDO <sup>1</sup>	Indirect				.00 [-.04, .04]	-.02 [-.07, .02]	-.03 [-.09, .01]
					-.02[-.08, .00]		
R <sup>2</sup>		.02	.08	.02	.05	.15	.18

*Note.*  $N = 327$ . \*\* indicates the path is significant at  $p < .01$ , \* indicates the path is significant at  $p < .05$ . RWA = right-wing authoritarianism; SDO = social dominance orientation; SYMB = symbolic threat; ANX = intergroup anxiety; STE = Stereotype threat; JS= Attitude ratings of target, Vegans= Attitude ratings of vegans, Sikh vegans/vegetarians=Attitude ratings of Sikh vegans/vegetarians. 1.RWA and SDO were correlated in this model.  $r = .526$ ,  $p < .05$

***Vegan threat model (Hypothesis 3c).*** For the veganism threat path model, RWA and SDO both had significant direct effects on veganism threat. RWA and SDO together accounted for 12% of the variance in veganism threat. SDO and veganism threat showed significant direct effects on attitudes towards vegans. Additionally, only SDO had a significant direct effect on attitudes towards Sikh vegans/vegetarians, whereas no variable had significant direct effects on attitudes towards JS. Ideology and veganism threat together explained 1%, 8% and 8% variance in attitudes towards JS, vegans and Sikh vegans/vegetarians respectively.

The indirect effects of RWA and SDO on attitudes towards vegans via veganism threat were significant. These effects were very small and in the negative direction (see Table 3.5 for values). Being higher on RWA and SDO predicted more negative attitudes towards vegans, this effect being mediated by perceptions of veganism threat. The indirect effects of both ideology variables on attitudes towards JS and Sikh vegans/vegetarians however, were not significant. Therefore, the proposed model and hypothesis 3c were partially supported, with the data providing evidence for pathways from both RWA and SDO predicting attitudes towards vegans.



Table 3.5

*Standardized direct and indirect effects of ideology, Veganism threat, on attitude ratings for the target individual, vegans and Sikh vegans/vegetarians in Study 1*

IV	Effects	Criteria			
		VEG	JS	Vegans	Sikh vegans/vegetarians
RWA <sup>1</sup>	Direct	.23**[.12, .35]	.06[-.08, .19]	.05[-.07, .19]	-.03[-.15, .11]
SDO <sup>1</sup>	Direct	.16**[.04, .29]	-.11[-.23, .07]	-.23**[-.36, -.11]	-.21**[-.38, -.09]
Veganism threat	Direct		-.019[-.13, .09]	-.15**[-.28, -.04]	-.10 [-.20, .03]
RWA <sup>1</sup>	Indirect		-.00[-.04, .02]	-.03**[-.08, -.01]	-.02 [-.05, .01]
SDO <sup>1</sup>	Indirect		-.00[-.02, .02]	-.02**[-.06, -.00]	-.02 [-.05, .00]
R <sup>2</sup>		.12	.01	.08	.08

*Note.*  $N = 327$ . \*\* indicates the path is significant at  $p < .01$ , \* indicates the path is significant at  $p < .05$ . RWA = right-wing authoritarianism; SDO = social dominance orientation; VEG = veganism threat; JS= Attitude ratings of target, Vegans= Attitude ratings of vegans, Sikh vegans/vegetarians=Attitude ratings of Sikh vegans/vegetarians. RWA and SDO were correlated in this model.  $r = .526$ ,  $p < .05$ .

## Appendix Q

### Behavioural Intentions Scale (Husnu & Crisp, 2010)

#### Study 2

1) How much do you intend to interact with vegans in the future?

1	2	3	4	5	6	7
Not at all					Very much	

2) How much time do you think you might spend learning about veganism?

1	2	3	4	5	6	7
Not at all					Very much	

3) How important do you think interacting with vegans is?

1	2	3	4	5	6	7
Not at all					Very much	

4) How willing would you be to attend an informational event about veganism and learn about vegan beliefs and lifestyle?

1	2	3	4	5	6	7
Not at all					Very much	

Appendix R  
Attitudes (Wright et al., 1997)  
(Study 2)

Based on your experience please rate the extent to which you have each of the following feelings about vegans in general. (Please circle one number on each scale).

Do you feel.....

WARM	1	2	3	4	5	6	7 COLD
NEGATIVE	1	2	3	4	5	6	7 POSITIVE
FRIENDLY	1	2	3	4	5	6	7 HOSTILE
SUSPICIOUS	1	2	3	4	5	6	7 TRUSTING
RESPECT	1	2	3	4	5	6	7 CONTEMPT
ADMIRATION	1	2	3	4	5	6	7 DISGUST

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