**Relational climate and openness to plant-forward diets among cohabitating couples**

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 **Abstract**

Plant-forward diets offer a potential solution to many of the health and ecological crises that we find ourselves facing today. A key barrier to the adoption and maintenance of plant-forward diets is an anticipated lack of support from family members, friends and romantic partners. The present study examined how *relational* *climate* (i.e., the cohesion and flexibility of a partnership) contributes to the tension individuals anticipate in their relationship when a member reduces their animal-product consumption, and their own openness to reducing. Four hundred and ninety-six coupled individuals took part in an online survey. Analyses revealed that couples with more flexible leadership styles anticipated less tension should they or their partner adopt a plant-forward diet. However, dimensions of relational climate were largely unrelated to openness to plant-forward diets. Romantic couples who perceived themselves to be *matched* in terms of dietary habits were less open to reducing their animal-product consumption than *unmatched* couples. Politically left-leaning couples and females were more open to plant-forward diets. The meat attachments of male partners were reported as a particular barrier to dietary goals, as were practical concerns about meal coordination, finance, and health. We discuss implications for promoting plant-forward dietary transitions.

*Keywords:* meat reduction, relationships, relational climate, cohesion, flexibility

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1. **Introduction**

There is a growing concern that modern-day animal agriculture bears health and ecological costs that cannot be sustained (e.g., see Willett et al., 2019). The production and consumption of industrially reared animal foods has been linked to a number of personal and public health consequences (e.g., the emergence of zoonotic diseases; see Jones et al., 2013), and a disproportionate share of food-related environmental impacts (Dagevos & Voordouw, 2013). In contrast, plant-forward diets offer a potential solution to many of the health and ecological crises that society faces, and that we can expect to face in the near future (Willet et al., 2019). Nonetheless, the consumption of animal foods remains a socially normative practice. It is estimated that approximately 73% of the global population maintain an omnivorous diet (IPSOS Mori, 2018), consuming on average 43kg of meat each year (Ritchie et al., 2017) rates which continue to rise exponentially (Whitnall & Pitts, 2019). As such, willingness to reduce or forego the consumption of animal products remains low in most western societies, with intention estimates between 14%-16% for meat-consumption reduction (Bryant, 2019; Lacroix & Gifford, 2019; Lea et al., 2006). Accordingly, a comprehensive body of research has sought to understand why individuals may be unwilling to reduce and how these barriers might be overcome (for recent reviews, see Bryant et al., 2021; Graça et al., 2019).

One barrier sometimes identified in self-report studies of meat and animal-product reduction is an anticipated lack of support among a person’s primary social group—family members, friends, but, especially, romantic partners (Hodson & Earle, 2018; Lacroix & Gifford, 2019; Markowski & Roxburgh, 2019). In particular, studies of ex-vegetarians and vegans’ retrospective reports often include mention of the struggles they faced coordinating their diets with close others (e.g., see Asher et al., 2014; Haverstock & Forgays, 2012; Menzies & Sheeshka, 2012). Clearly, the relational context in which an individual undertakes a dietary transition is an important moderator of engagement and success. Nonetheless, research into the relational dynamics affecting the attempt and maintenance of plant-forward transitions, remains largely unexplored. Here, we conducted a foundational investigation to better understand how *relational* *climate* -- the cohesion and flexibility of a relationship -- relates to the current dietary practices of cohabitating couples and an individual’s openness to pursuing a plant-forward transition. This preliminary work should provide scope for further inquiry into the role of relational climate for the pursuit and maintenance of plant-forward diets.

**1.1 Social and relational barriers to meat reduction**

Romantic relationships represent a primary social group in which individuals derive socially normative behaviour. Berger and Kellner’s (1964) classic work on the social construction of identity, argues that forming a committed relationship is a process whereby two strangers come together, redefine themselves and begin to view themselves as a collective unit. One aspect of daily life that couple’s must fuse together is diet: establishing collective consumption practises (e.g., shopping, cooking, eating) and deciding what food products fulfil their shared needs. Given the co-ordinated nature in which couples consume food (Sobal, 2005), an individual’s partner represents a key influence on a person’s eating patterns, if not, for couples, the *strongest* influence (e.g., see Øygard & Klepp, 1996). Thus, when a partner considers a change in their eating behaviour, a decision of this nature inextricably impacts on the other and can lead to complications, if one’s partner resists (Eriksen, 1994). As a result, diet, and dietary *transitions* in particular, can be a significant source of friction among partners. Indeed, studies suggest that close relationships represent a *mixed* source of dietary support and impediment. For example, Paisley et al. (2008) explored dieters’ transitions to low-sugar, low-carb diets, and found that emotional responses from the partner varied considerably, from cooperation and encouragement to scepticism, aggravation, and hostility. Transitions away from animal products may be especially contentious for couples, given the strong attachments many people have with these foods (Graça et al., 2015). Thus, how partners relate to one another, and the perceptions they have of their partner’s support, likely modulate their openness to plant-forward dietary transitions.

The present research considered how the “relational climate” of a couple impacts on their orientation towards plant-forward transitions. According to Family Systems Theory (Miller & Brown, 2005; Olson, 2011), relational systems can be modelled along four dimensions: flexibility, cohesion, communication and satisfaction. Here, we focused on flexibility and cohesion. *Flexibility* entails how relational units manage and adapt to changes in leadership, roles, and rules. Moderately flexible relationships involve egalitarian styles of leadership and mostly democratic approaches to decision-making where negotiations are open, roles are shared, and rules can change when necessary. Overly flexible or “chaotically flexible” relationships are characterised by erratic or limited leadership. Within such units, decisions can be impulsive, roles and rules are unclear and fluid. At the other extreme, rigid flexibility is characterised by one-sided, highly controlling leadership, strictly defined roles and rules, leaving limited room for negotiation. *Cohesion* relates to the emotional bonding that a couple or family members have towards one another. Moderately cohesive relationships strike a healthy balance between independence and connection. They value emotional closeness, togetherness, and joint-decision making, while respecting the other’s independence. In the extreme, “enmeshed cohesion” demands high levels of dependence and loyalty, restricts personal boundaries and freedom. At the opposite extreme, “disengaged cohesion” is characterised by extreme emotional separateness and independence, with individuals tending to lead their own lives, preoccupied with their own social circles and personal interests.

In addition to the relational context itself, openness to dietary change is likely shaped by partner attributes, including: gender identity and ideology. In the context of plant-forward transitions, gender identity may be important moderator particularly among heterosexual couples. Compared to men, women tend to be more conscious of their animal-product consumption and are more willing to change these consumption patterns (e.g., see Fonseca & Sanchez-Sabate, 2022). Furthermore, traditional views of masculinity are often at odds with meat-free diets, due to the symbolic potency of meat as a “male” prerogative (e.g., see Rozin et al., 2012; Salmen & Dhont, 2022; Sobal, 2005). In practice, the food preferences of heterosexual women often fall subordinate to those of their male partner and their children (Bove et al., 2003; Charles & Kerr, 1988; Hochschild & Machung, 2015). Though, research suggests that this may be modulated by one’s views around gender roles, with egalitarian partnerships more inclined to compromise on food choices than those couples who endorse more traditional gender roles (Brown & Miller, 2002). Indeed, attitudes towards animal products are shaped by wider ideological factors, such as political orientation - with politically right-leaning individuals often consuming more animal products than left-leaning or centrist individuals (e.g., see Dhont & Hodson, 2014; Grünhage & Reuter, 2020).

* 1. **The current study and research questions**

In the present study, we sought to investigate how the dietary alignment and relational climate of cohabiting couples relates to their current dietary practises and openness to plant-forward dietary transitions. In particular, we considered the *flexibility* and *cohesion* dimensions of relational climate (Olson, 2011) of animal-product consumers currently within a long-term relationship. Our research was guided by several preregistered questions (AsPredicted: #93437, available here: <https://aspredicted.org/fu3td.pdf>). We considered how relational climate and a person’s perception of their dietary alignment with their partner relates to their current dietary practises and their predictions about how smoothly they would manage a transition to a plant-based diet. Though the study was largely exploratory, we hypothesised that, relative to unmatched meat-eating couples, matched couples would anticipate greater diet-related tension in the event that either themselves or their partner reduced their consumption of animal products. In addition, we pre-registered the prediction that *balanced* relational systems (i.e., moderately flexible and cohesive couples) would foster greater dietary coordination, lower tension and increased openness to plant-forward dietary transitions.

We also engaged in an exploratory analysis to understand how characteristics of the couple—specifically, gender and political orientation—might interact with relational climate to impact on these diet-related outcomes. We expected left-leaning partnerships would foster a relational environment that is more seamlessly able to adopt plant-forward diets. In addition, we expected that, within heterosexual couples, women would report being more open to plant-forward diets than their male counterparts, whose preferences for animal products may be a potential source of conflict.

1. **Method**

**2.1 Recruitment and sample demographics**

We recruited a sample of people in a romantic relationship and cohabiting with their partner. To do this, we used the pre-screening tools of the crowdsourcing platform, Prolific. Participants confirmed that they were 1) “in a romantic relationship, cohabiting with my partner” (*n* = 162), or 2) “married, or in a domestic partnership, cohabiting with my partner” (*n* = 334)[[1]](#footnote-1). Participants who indicated “neither of the above apply to me” were ineligible. The study was concerned with individuals who eat at least some animal products. As preregistered, we used Prolific’s pre-screening tool to omit individuals practicing a ‘Vegan Diet’ and included those who selected ‘I do not follow any diet’, ‘Vegetarian Diet’, ‘Pescatarian Diet’, as well as other non-vegan diets (e.g., ‘Atkins Diet’).

Our recruitment strategy was guided by an a *priori* power analysis. We calculated that a lower-bound sample target of *N* = 386 would give us 0.95 power to detect a modest effect size (*f* = 0.20) with an error probability of 0.05. We aimed to over sample, with an upper-bound target of 500 participants. For group-based comparisons of diet-matched and unmatched couples, we calculated that we would need a minimum split of *N* = 105/395 in order to detect a modest effect size (*f* = 0.40) with 0.95 power and an error probability of 0.05. Five-hundred participants completed the survey. Four participants were excluded having indicated that they abstained from all animal food products, either by classifying themselves as a *dietary vegan* (*n*=1) or *strict vegetarian* (*n*=3). Our final sample thus met these thresholds for power. See Table 1 for sample demographics.

**Table 1.**

*Sample demographics by participant and partner.*

|  |  |  |
| --- | --- | --- |
|  | **Participant** | **Partner**  |
| Gender | 244 male (48.4%), 249 female (49.8%), two agender/non-binary (0.4%), 1 other (0.2%) | 253 male (51%), 240 female (48.4%), 3 agender/non-binary (0.6%)  |
| Age | *M*= 45.50 years, *SD=* 12.86, range 20-82 | *M*= 45.69 years, *SD*= 13.28, range 20-85  |
| Nationality | 450 British (90.7%), 46 other (9.3%) | 439 British (88.5%), 57 other (11.5%) |
| Ethnicity | 470 White (94.8%), 15 Asian (3.0%), 3 Black/African (0.6%), 3 Latino (0.6%), 5 other (1.0%) | 453 White (91.3%), 25 Asian (5%), 7 Black/African (1.4%), 3 Latino (0.6%), 8 other (1.6%) |
| Political orientation | 226 liberal (45.5%), 129 neutral (26.0%), 141 conservative (28.4%) | 211 liberal (42.5%), 153 neutral (30.8%), 132 conservative (26.6%) |
| Sexual orientation | 462 heterosexual (93.1%), 15 bisexual (3.0%), 6 gay (1.2%), 3 lesbian (0.6%), 5 pansexual (1.0%), 3 queer (0.6%), 1 questioning or unsure (0.2%), 1 preferred not to say (0.2%) | 468 heterosexual (94.4%), 13 bisexual (2.6%), 5 gay (1%), 2 lesbian (0.4%), 4 pansexual (0.8%), 2 queer (0.4%), 2 were questioning or unsure (0.4%) |

**2.2 Materials**

**2.2.1 Current eating habits.** To profile participants and their partner on their current eating habits, we used a pre-existing scale of dietary classification (Piazza et al., 2018). Participants were asked to select the category (definitions provided) that best matches their current dietary identity, and that of their partner: (1) meat lover (i.e., *I prefer to have meat in all or most of my meals)*, (2) omnivore (*I eat meat and other animal products, like dairy and/or eggs)*, (3) semi-vegetarian or reducetarian (*I eat meat, but only on rare occasions or only certain types of meat*), (4) pescatarian (*I eat fish and/or seafood, as well as dairy products and eggs, but no other meat*), (5) lacto- or ovo-vegetarian (*I eat dairy products and/or eggs, but no meat or fish*), (6) strict vegetarian (*I eat no animal products, including dairy and eggs, but would not consider myself full vegan*), (7) dietary vegan (*I eat no animal products, including dairy, eggs, honey, gelatin, etc.*) and (8) lifestyle vegan (*I never consume any animal products, and avoid all non-food animal products, including leather, silk, wool, cosmetics containing animal ingredients, etc*). They indicated whether they themselves, or their partner, were currently transitioning between dietary classifications (Yes/No) and, if so, to which category they were transitioning.

Next, participants reported the extent to which they, and, secondly, their partner, were currently reducing each of the following products: red meat, white meat, fish, seafood, dairy milk, dairy cheese, and eggs, on a 1-7 Likert scale, where *1 = not reducing at all, to 7 = actively reducing*. An additional option, *“I/They never eat this”*, was includedfor those who had already eliminated the product. See Supplemental Materials A for descriptive details on reduced and eliminated products.

**2.2.2 Perceived dietary alignment.** To assess whether participants perceived themselves matched or unmatched with their partner’s dietary goals, we had participants complete the following question: “Would you say that you and your partner are aligned in your eating habits and dietary goals?” Participants selected one of three options: *1) ‘yes we are completely aligned’, 2) ‘we are sort of aligned, but not in every aspect’ and 3) ‘we are not aligned’*. As pre-registered, participants who selected option 1 (*n*=138) were placed into the matched group, and those selecting option 2 *(n=*332) or 3 *(n=*26) were placed into the unmatched group (*n*=358).

**2.2.3 Relational climate.** Relational climate was assessed using an adapted version of the cohesion and flexibility subscales of the FACES-IV Scale, a highly valid and reliable scale (Cronbach α =0.90; Olson, 2011). Small alterations were made to the wording of certain items to ensure that we asked about the couple rather than the family unit, e.g., “Family members are involved in each other’s lives*”* was changed to *“*My partner and I are involved in each other’s lives*”.* Participants rated a total of 42 statements on the extent to which they agreed or disagree with each on a 1-7 Likert scales (1 *= strongly disagree,* 7 *= strongly agree*). Twenty-one items each comprised the cohesion scale and the flexibility scale. The two scales are further broken down into three subscales of seven items. The cohesion scale measures the extent to which a couple is: *balanced* (e.g., “My partner and I have a good balanced of separateness and closeness”), *disengaged* (e.g., “My partner and I mainly operate independently”)and *enmeshed* (e.g., “My partner and I feel pressure to spend most free time together”).The flexibility scale measures the extent to which a couple is: *balanced* (e.g., “My partner and I are able to adjust to change when necessary”), *rigid* (e.g., “Our relationship becomes frustrated when there is a change in our plans or routines”) and *chaotic* (e.g., “We feel hectic and disorganized”). Following Olson (2011), cohesion and flexibility scores are calculated with the formula:

$$Cohesion=Balanced+ \frac{(Disengaged-Enmeshed)}{2}$$

$$Flexibility=Balanced+\frac{(Rigid-Chaotic)}{2}$$

For a full list of the FACES-IV Scale items, see Supplemental Materials B.

**2.2.4 Food coordination.** To assess the degree of food preparation and consumption couples engaged in together, participants were asked how frequently they performed the following activities with their partner: *shopping*, *cooking*, and *eating*, each on 1-7 Likert scales (1 *= never,* 7 *= often*). Participants were additionally asked how frequently they eat the same foods as their partner (1 *= never eat the same foods,* 7 *= always eat the same foods*). Lastly, participants rated, overall, how aligned they perceived their partner’s eating habits and dietary goals to be with their own (1 *= not at all aligned, 7 = very aligned*). These five items were developed by the research team and aggregated to provide an average score of food coordination (α = .70) with higher scores indicating greater coordination. We asked an additional two miscellaneous coordination items, not used to calculate the *coordination* index, but for descriptive purposes. Participants were asked to indicate who in their household is predominantly responsible for 1) buying food and 2) cooking meals. They were asked to indicate their response by selecting one of the following options: *myself* (*n*=204, *n*=203, respectively), *my partner* (*n*=78, *n*=132), or *equal responsibility* (*n*=214, *n*=161).

**2.2.5 Dietary harmony.** To assess how harmonious participants perceived their efforts to coordinate their food habits with their partner, they were asked: **“**How harmoniously would you say you and your partner perform the following activities together?” The items included *shopping*, *cooking*, and *eating*, scored on a 1-7 Likert scales (1 *= not at all harmoniously,* 7 *= very harmoniously*). The three items were devised by the research team and aggregated to form an index of *harmony* (α = .70), with higher scores indicating greater harmony.

**2.2.6 Current diet-related tension.** To assess the extent to which participants perceived there to be *diet-related tension* in their relationship, participants rated, “To what extent does your diet, or your partner’s diet, cause tension in your relationship?” on a 1-7 Likert scale (1 *= no tension at all,* 7 *= a lot of tension*), a single-item measure, devised by the research team. Higher scores indicated greater perceived diet-related tension.

**2.2.7 Openness to plant-based dietary transitions.** To determine the extent to which participants were open to reducing their consumption of animal products, participants first read: “There is a growing consensus among scientists that diets low in meat and animal products, comprised mainly of plant-based sources (e.g., fruits, vegetables, grains, pulses), are both better for human health and the planet – for example, they generate a smaller carbon footprint.”Participants were then presented with the following food items: *red meat*, *white meat*, *fish*, *seafood*, *dairy milk*, *dairy cheese*, and *eggs.* They were asked: “How open are you to reducing your daily consumption of the following foods?” and indicated their response on a 1-7 Likert scale (1 *= not open at all,* 7 *= very open*). We included an additional option, “I never eat this”,for those who had already eliminated the product from their diet. The seven items were averaged to provide an index of *openness to plant-forward diets*, with higher scores indicating greater openness. See Supplemental Materials C for descriptive details of openness to reduce ratings, by animal product.

**2.2.8 Anticipated diet-related tension.** To assess the extent to whicha member reducing their animal-product consumption would cause tension in the relationship, we asked: “To what extent would further reduction in meat and animal products in your diet, or your partner’s diet, cause tension in your relationship?” Participants indicated their response on a 1-7 Likert scale (1 *= no tension at all,* 7 *= a lot of tension*), a single-item measure, devised by the research team. Higher scores indicated greater anticipated tension. Participants who selected any option between 2-7 were additionally asked: “Why do you think further reduction would cause tension in your relationship?” Participants were required to provide a written response to this open-ended question.

**2.3 Procedure**

Participants took part in an online survey, hosted via the crowdsourcing platform Prolific. All participants provided their consent and answered demographic questions. Participants then completed measures pertaining to their current eating habits and that of their partners, their perceived diet-matching, relational climate, coordination, harmony, tension, openness to plant-forward diets and anticipated tension. Upon completion of the survey, all participants were debriefed and compensated £2.41 (a sum higher that UK National Living Wage, or £13.13/11 minutes) for their time.

**2.4 Analysis Plan**

An anonymized version of our data, as well as all Supplementary Materials can be accessed via OSF here: <https://osf.io/gb79m/>.

**2.4.1 Quantitative data.** To explore the corollaries of perceived dietary matching, we conducted a series of independent t-tests, comparing the means of matched and unmatched couples on each of our five outcome variables of interest: food-related coordination, harmony, tension, openness to plant-forward diets and anticipated tension. Here we adjusted alpha to *p* < .01 for multiple testing (i.e., *p* = .05/5 = .01). When equal variances were not assumed, Welch’s test was used. Where data were non-normally distributed[[2]](#footnote-2), we employed Mann-Whitney *U*. Next, we conducted an exploratory correlation analysis to determine how the variables in our dataset, related to one another, including the relational climate dimensions, flexibility and cohesion, each of their subscales, and our five outcome variables. Where data were non-normally distributed, we employed Spearman’s rho.

This preliminary correlation analysis preceded our regression analysis which investigated the relationship between relational climate and the five outcome variables. Flexibility and cohesion were included as simultaneous predictors in each model and as such, we adjusted alpha by the number of predictors (i.e., *p* = .05/2 = .025). To further explore the relevance of these relational constructs in a more nuanced manner, we decomposed each dimension into their three subcomponents: (a) balanced, disengaged, and enmeshed cohesion, and (b) balanced, rigid, and chaotic flexibility. Two further sets of regression models were conducted, treating each subscale as a simultaneous predictor of the three relevant outcomes (thus, *p* = .05/3 = .0167). We supplemented our analysis with a number of exploratory tests investigating the relationship between key demographic variables (i.e., age, gender and political orientation) and openness to plant-based dietary transitions.

**2.4.2 Qualitative data.** A qualitative analysis was conducted to shed further light on why a reduction of animal-product consumption might lead to relational tension. We acquired a total of 274 qualitative responses, where participants explained why they felt that further reduction of their animal-product consumption would lead to relational tension. To process this data, we adopted a stepwise coding method, akin to that of Juvan and Donclair (2014), comprised of two-steps: first, we reviewed the data to create a data-driven code scheme; second, the data was independently coded by two trained blind coders. On first inspection of the data, a number of themes were apparent. A sizable portion of participants felt that tension might arise because neither themselves nor their partner were open to reducing. In general, the barriers perceived by participants related to *practicality* (e.g., the need to cook two separate meals, less choice), *emotion* (e.g., the responsibility falling on one person leading to stress) and *finance* (e.g., additional cost of cooking two meals). Where the participant was open to reducing their consumption of animal foods, they often indicated that their partner or the wider family unit (e.g., children) were a barrier to personal reduction.

Based on this initial inspection, the research team developed a binary coding scheme which coded for presence (1) or absence (0) of seven themes, divided into two categories. The first category related to the source of the anticipated tension and was associated with two mutually exclusive themes: 1) tension from both parties and 2) tension from one party. The remainder of the codes (non-exclusive themes) fell into the final category and were related to barriers that participants anticipated in relation to reduced animal-product consumption: 3) practicality, 4) emotion, 5) finance, 6) social, and 7) health. Entries (273 total) were scored for the occurrence of each code – see Table 2 for definitions – by two trained coders, blind to the study’s specific aims. To determine agreement across the coding scheme, we ran a series of Cohen’s κ statistics. Agreement was moderate-to-strong (κ range = .653-.983) and differed significantly from zero for all (*p* < .001)—see Supplemental Materials D for details on code prevalence.

**Table 2**

*Qualitative code scheme, each of the seven code labels and their descriptors*

|  |  |  |
| --- | --- | --- |
| Category  | Code Label | Description |
| Source of anticipated tension | Both parties | The participant indicates that neither themselves nor their partner would want to reduce. Hence, they anticipate that tension would arise from both sides of the relationship. |
| One party | The participant indicates that though they might be open to reduction, their partner would not be as open (or vice versa). Hence, they anticipate that tension would arise from one side of the relationship.  |
| Barriers to reducing animal product consumption | Practicality | The participant mentions the added impracticality brought about by reducing, e.g., the need to cook extra or separate meals, which would incur a time or resource hardship. |
| Emotion | The participant sees the consequences of reducing as emotional in nature (e.g., causing frustration, stress). |
| Finance | The participant argues that reduction would lead to an added financial cost. |
| Social | The participant argues that a reduction would be difficult to manage in social settings, outside of the relationship (e.g., family BBQs, at restaurants, etc.) |
| Health | The participant argues that reduction would cause them to incur a health or nutritional consequence (e.g., loss of protein, etc.) |

**3. Results**

Most of our sample identified as *omnivore* (*n* = 305, 61.5%), followed by *meat lover* (*n* = 100, 20.2%), *semi-vegetarian* or *reducetarian* (*n* = 61, 12.3%), *lacto- or ovo-vegetarian* (*n* = 17, 3.4%), *pescatarian* (*n* = 13, 2.6%). The vast majority of participants in our sample indicated that their partners identified as an omnivore (*n* = 274, 55.2%), followed by *meat lover* (*n*=137, 27.6%), *semi-vegetarian* or *reducetarian* (*n*=59, 11.9%), pescatarian (*n*=10, 2%), *lacto- or ovo- vegetarian* (*n*=10, 2%), *strict vegetarian* (*n*=5, 1%) *dietary vegan* (*n*=1, 0.2%). Most participants indicated that they (*n* = 475, 95.8%) and their partner (*n* = 476, 96%) were not currently pursuing a transition between dietary classifications. See Supplemental Materials E for descriptive details on dietary transitions.

**3.1 Distribution of matched and unmatched couples**

Contrary to expectations, the vast majority of participants perceived the eating habits and dietary goal of themselves and their partner to be unmatched (*n* = 358), with a smaller group matched *(n =* 138). We pre-registered that we would additionally manually code the dietary classifications and dietary goals of participants and their partners for being either ‘matched’ or ‘unmatched’, as an ancillary check on the direct measure of perceived dietary alignment. However, too few participants provided an affirmative response to the question on dietary transitions for us to perform this computation with the data. In terms of current dietary classification, 334 participants were matched with their partner and 162 were unmatched. Of note, reported dietary classifications of the couples often failed to align with their *perception* of being matched or unmatched.Though the vast majority of our participants reported the same dietary classification as their partner (*n* = 334), much fewer *perceived* the eating habits and dietary goals of their partner to entirely match their own *(n =*138). Arguably, the subjective experience of dietary alignment (perceived alignment) is psychologically more meaningful than dietary classifications (e.g., a person may classify their partner with the same label but still feel unmatched), thus, below we report the results for perceived matching and supplement the analyses for classification matching[[3]](#footnote-3) (see Supplemental Materials F).

**3.2 Dietary characteristics of matched and unmatched couples**

We found that matched couples reported significantly greater food coordination than unmatched couples, *t*(494) = 9.485, *p*< .001, *d* = 0.95, 95% CI [.75, 1.16]. Matched couples reported significantly greater harmony than unmatched couples, *t*(300.18) = 10.336, *p*< .001, *d* = 0.49, 95% CI [.29, .69]. Matched couples (*M*rank = 211.92) reported significantly lower diet-related tension than unmatched couples (*M*rank = 262.60), *U* = 29750.50, z = 4.08, *p* < .001, 95% CI [.00, .03]. Contrary to expectations, there was no significant difference between matched couples and unmatched couples on anticipated diet-related tension, *t*(494) = -0.97, *p* =.333, *d* = -.097, 95% CI [-.29, -.10]. Lastly, matched couples reported significantly lower openness to plant-forward transitions than unmatched couples, *t*(223.94) = -3.18, *p*= .002, *d* = -0.34, 95% CI [-.53, -.14]. See Table 3 for all means and standard deviations.

**Table 3**

*Dietary characteristics of perceived matched and unmatched couples.*

|  |  |  |
| --- | --- | --- |
|  | Matched | Unmatched |
| Food coordination | 5.8a (0.8) | 5.0b (0.9) |
| Dietary harmony | 5.9a (1.0) | 5.3b (1.3) |
| Current diet-related tension | 1.4b (0.9) | 1.7a (1.1) |
| Anticipated diet-related tension | 2.1a (1.5) | 2.2a (1.4) |
| Openness to plant-based dietary transitions | 3.1b (1.7) | 3.7a (1.5) |

*Note.* Different subscripts are significantly different at *p* < .01.

**3.4 Exploratory correlation analysis**

We first observed the correlational relationship between the relational climate dimensions and the five outcome variables. Table 4 provides a matrix of these correlations. In sum, couples who reported greater cohesion, balanced cohesion, flexibility and balanced flexibility reported greater food coordination, greater dietary harmony and lower diet-related tension. By contrast, couples who reported greater disengaged cohesion and chaotic flexibility reported less food coordination. Further, couples who reported greater disengaged and enmeshed cohesion, rigid and chaotic flexibility reported less dietary harmony and greater diet-related tension. Couples high in disengaged and enmeshed cohesion and chaotic flexibility were more likely to anticipate tension if one of the two transitioned to a plant-forward diet. In contrast, couples that reported greater overall flexibility and cohesion, as well as *balanced* flexibility and cohesion were less likely to anticipate tension if one transitioned to a plant-forward diet, though significant, it is important to note that the magnitude of these effects are small. Couples who reported greater balanced cohesion and greater overall flexibility reported a lower openness to plant-based dietary transitions, whereas couples who reported greater chaotic flexibility reported greater openness—though, again, these relationships were weak.

**Table 4**

*Correlation matrix of the relational climate measures and diet-related outcome.*

|  |  |
| --- | --- |
|  | Diet-related outcomes |
| Food coordination | Dietary harmony | Current diet-related tension | Anticipated diet-related tension  | Openness to plant-based transitions |
| *Cohesion* | .196\*\* | .259\* | -.181\*\* | -.122\*\* | -.035 |
| Balanced  | .430\*\* | .443\*\* | -.312\*\* | -.163\*\* | -.113\* |
| Disengaged  | -.383\*\* | -.393\*\* | .292\*\* | .126\*\* | -.004 |
| Enmeshed  | -.001 | -.106\* | .157\*\* | .097\* | -.062 |
| *Flexibility* | .358\*\* | .331\*\* | -.206\*\* | -.121\*\* | -.110\* |
| Balanced  | .420\*\* | .449\*\* | -.279\*\* | -.170\*\* | -.076 |
| Rigid  | -.073 | -.176\*\* | .157\*\* | .070 | -.032 |
| Chaotic  | -.254\*\* | -.256\*\* | .182\*\* | .089\* | **.**111\* |

Notes: \*\*correlation is sig at 0.01 level, \*correlation is sig at 0.05 level. Spearman’s rho was employed as a non-parametric alternative to Pearson’s r for variables that were non-normally distributed.

 Next, we observed the correlational relationship between our five outcome variables. Table 5 provides a matrix of these correlations. In sum, participants who reported being coordinated with their partner in their dietary goals reported more harmonious eating habits, less eating-related tension, anticipated less tension if they or their partner transitioned to eating fewer animal products. Of note, couples with higher levels of food-related tension reported somewhat more openness to plant-based diets, though the magnitude of this correlation was small. Not surprising, those who frequently experienced food-related tensions were more likely to anticipate tension if one of the two transitioned to a plant-forward diet. Openness to a plant-based diet was unrelated to food coordination, harmony, and anticipated tension.

**Table 5**

*Correlation matrix of the diet-related measures.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 1. | 2. | 3. | 4. | 5. |
| 1. Food coordination | - | .639\*\* | -.273\*\* | -.133\*\* | -.045 |
| 2. Dietary harmony |  | - | -.311\*\* | -.191\*\* | -.024 |
| 3. Current diet-related tension |  |  | - | .342\*\* | .147\*\* |
| 4. Anticipated diet-related tension  |  |  |  | - | -.086 |
| 5. Openness to plant-based dietary transitions  |  |  |  |  | - |
| Notes: \*\*correlation is sig at 0.01 level, \*correlation is sig at 0.05 level. Spearman’s rho was employed as a non-parametric alternative to Pearson’s r for variables that were non-normally distributed.  |

**3.5 Relational climate, food-related coordination, harmony and tension**

The overall correlation between cohesion and flexibility was weakly positive, *r*(496) = .24, *p* < .001, which speaks to the independence of these constructs. The regression analysis with flexibility and cohesion as simultaneous predictors (adjusted alpha *p* = .05/2 = .025) revealed that increasing relational flexibility was predictive of greater food coordination, *B*= .342, *t*(494) = 8.012, *p* < .001, 95% CI [.03, .05]. More flexible couples reported greater food-goal alignment. However, cohesion did not independently predict levels of alignment, *B*= .086, *t*(494) = 2.017, *p* = 0.44, 95% CI [.00, .03]. The regression model was overall significant, *F*(2,493) = 38.574, *p* < .001, adj.R2=.132. Flexibility was predictive of food-related harmony in the relationship, *B*= .299, *t*(494) = 7.024, *p* < .001, 95% CI [.03, .06]. Cohesion was also predictive of food-related harmony, *B*= .169, *t*(494) = 3.974, *p*< .001, 95% CI [.02, .05], though to a lesser degree. The regression model was significant, *F*(2,493) = 39.259, *p* < .001, adj.R2=.134. Lastly, more flexible couples reported less diet-related tension, *B*= -.151, *t*(494) = -3.358, *p* = .001, 95% CI [-.03, -.01], and so did more cohesive couples, *B*= -.113, *t*(494) = -2.509, *p*= .012, 95% CI [-.04, -.00], with an overall significant regression model, *F*(2,493) = 10.769, *p* < .001, adj.R2=.038. Thus, as predicted, cohesive couples experienced less tension and more harmony in their food preparation efforts. However, unexpectedly, their eating habits and goals were not necessarily more tightly aligned. By contrast, flexible couples experienced higher levels of harmony, less tension, and were quite aligned in their diet-related practices.

To explore the relevance of these relational constructs in a more nuanced manner, we decomposed each dimension into their three subcomponents: (a) balanced, disengaged, and enmeshed cohesion, and (b) balanced, rigid, and chaotic flexibility. Two sets of regression models were conducted, treating each subscale as a simultaneous predictor of the three relevant outcomes (thus, *p* = .05/3 = .0167). First, with regards to cohesion, balanced couples reported greater food coordination, *B*= .247, *t*(494) = 5.405, *p* < .001, 95% CI [.03, .06], whereas disengaged couples reported lower scores of food coordination, *B*= -.294, *t*(494) = -6.204, *p* < .001, 95% CI [-.06, -.03]. Enmeshed cohesion did not predict levels of food coordination, *B*= .099, *t*(494) = 2.356, *p* =.019, 95% CI [.00, .03]. The regression model was overall significant, *F*(3,492) = 42.610, *p* < .001, adj.R2=.201. Balanced couples reported greater food-related harmony, *B*= .274, *t*(494) = 6.034, *p* < .001, 95% CI [.04, .08], whereas disengaged couples reported lower food-related harmony, *B*= -259, *t*(494) = -5.487, *p* < .001, 95% CI [-.07, -.03]. Enmeshed cohesion did not predict levels of food-related harmony, *B*= -.016, *t*(494) = -.388, *p* =.698, 95% CI [-.02, .01]. The regression model was overall significant, *F*(3,492) = 44.291, *p* < .001, adj.R2=.208. Balanced couples reported less diet-related tension, *B*= -.140, *t*(494) = -2.885, *p* = .004, 95% CI [-.04, -.01], whereas disengaged couples reported higher diet-related tension, *B*= .202, *t*(494) = 3.985, *p* < .001, 95% CI [.02, .05]. Enmeshed cohesion did not predict levels of diet-related tension, *B*= .055, *t*(494) = 1.214, *p* =.226, 95% CI [-.01, .02]. The regression model was overall significant, *F*(3,492) = 17.635, *p* < .001, adj.R2=.092.

Second, with regards to flexibility, balanced couples reported greater food coordination, *B*= .375, *t*(494) = 8.861, *p* < .001, 95% CI [.05, .07], whereas chaotic couples reported lower scores of food coordination, *B*= -.141, *t*(494) = -3.338, *p* < .001, 95% CI [-.03, -.01]. Rigid flexibility did not predict levels of food coordination, *B*= -.065, *t*(494)= -1.615, *p* =.107, 95% CI [-.02, .00]. The regression model was overall significant, *F*(3,492) = 40.606, *p* < .001, adj.R2=.194. Balanced couples reported higher scores of food-related harmony, *B*= .404, *t*(494)= 9.816, *p* < .001, 95% CI [.07, .10], whereas chaotic, *B*= -.135, *t*(494)= -3.296, *p* < .001, 95% CI [-.04, -.01], and rigid couples reported lower scores of food-related harmony, *B*= -.168, *t*(494)= -4.275, *p* < .001, 95% CI [-.04, -.01]. The regression model was overall significant, *F*(3,492) = 53.317, *p* < .001, adj.R2=.241. Balanced couples reported lower scores of diet-related tension, *B*= .-.249, *t*(494)= -5.591, *p* < .001, 95% CI [-.06, -.03], whereas rigid couples reported higher scores of diet-related tension, *B*= -.178, *t*(494) = -4.187, *p* < .001, 95% CI [.01, .03]. Chaotic flexibility did not predict diet-related tension, *B*= -.085, *t*(494)= -1.920, *p* =.55, 95% CI [.00, .03]. The regression model was overall significant overall, *F*(3,492) = 21.426, *p* < .001, adj.R2=.110.

**3.6 Relational climate, openness to plant-based eating, and anticipated tension**

Next, weexplored how relational climate relates to plant-forward transition outcomes. As predicted, flexibility was associated with lower anticipated tension if a member transitioned to a plant-forward diet, *B*= -.115, *t*(494)= -2.520, *p* = .012, 95% CI [-.03, -.00]. However, greater cohesion in a relationship was unrelated to anticipated tension, *B*= -.035, *t*(494) = -.770, *p*= .441, 95% CI [-.03, .01]. The regression model was significant, *F*(2,493) = 3.984, *p* = .019, adj.R2=.013. Unexpectedly, more flexible couples tended to report *lower* levels of openness to plant-based transitions, *B*= -.115, *t*(494)= -2.514, *p*= .012, 95% CI [-.04, -.01], and cohesion was unrelated to openness to greater plant-based eating, *B*= .025, *t*(494)= .540, *p*= .590, 95% CI [-.02, .03]; however, the overall regression model did not meet the adjusted threshold for significance, *F*(2,493) = 3.16, *p* = .043, adj.R2=.009, therefore, this result should be treated with caution.

We further explored the association between flexibility and lower anticipated tension by testing the subcomponents of flexibility in a regression. Balanced flexibility was associated with lower scores of anticipated tension, *B*= -.156, *t*(494)= -3.349, *p* = .001, 95% CI [-.06, -.02]. However, neither rigid flexibility, *B*= 0.66, *t*(494)= 1.491, *p* = .136, 95% CI [-.00, .03], nor chaotic flexibility, *B*= .043, *t*(494)= .914, *p* = .361, 95% CI [-.01, .03], were significantly related to anticipated tension. Thus, it is mainly among well-balanced (i.e., moderately flexible) couples where we observe *lower* levels of anticipated dietary tension.

**3.7 Exploration of couples’ demographics**

Correlational analysis revealed a positive relationship between a liberal political identity and openness to plant-based diets, both for the participant, *r*(496) = .236, *p* < .001, and the partner, *r*(496) = .221, *p* < .001. We also found a negative relationship between the political orientations of the partner and anticipated tension, *r*(496) = -.093, *p* = .039, suggesting that having a more conservative partner is related to anticipating greater tension. Of the relational climate dimensions, we found a positive relationship between liberal political identity and chaotic flexibility, both for the participant, *r*(496) = .154, *p* = .001, and the partner, *r*(496) = .181, *p* < .001. Note that, unsurprisingly, the reported political orientation of participants and their partners was highly correlated, *r*(496) = .704, *p* < .001, with the majority of participants reporting the same orientation (*n* = 294, 59.27%). Participant age, *r*(496) = -.096 *p* = .033, but not partner age, *r*(496) = -.070, *p* = .120, was negatively related to openness, with younger participants reporting more openness to plant-based diets. Of the relational climate dimensions, we found a negative relationship between age and balanced flexibility, both for the participant, *r*(496) = -.091, *p* = .042, and the partner, *r*(496) = -.107, *p* = .018. Male- (*M* = 3.43, *SD* = 1.57) and female-identified participants (*M* = 3.62, *SD* = 1.54) did not differ significantly in their levels of openness, *t*(491) = -1.342, *p* =.180, *d* = -.12, 95% CI [-.46, .09].

**3.8 Qualitative analyses: Anticipated tension**

 There were 77 instances whereby participants anticipated that tensions would arise *jointly*. They saw the reduction of animal food products as something that would threaten both members’ freedoms, which would have negative consequences for the relationship: *“we would be irritable for not being able to eat what we want”.* Reduction of animal foods was often framed negatively as something *“taken away”* and linked to shared negative affect, including collective sadness (*“we would be sad without cheese”),* irritability (*“we would be irritable”)* and stress (*“taking something away would add to the stress of what to eat”*). There was also mention of the psychophysiological state of being *“hangry”,* a portmanteau of hungry and angry and a colloquial term that has since been validated by scientific research (Swami et al., 2022)*.* Where participants anticipated that tension would arise jointly, they sometimes appealed to the nutritional and satiation value of animal-derived food products as reasons for its continued consumption: e.g., “*It* [meat] *is a good source of protein*”; “*It is something we…crave for energy*”; “*It would be hard to find varied meals that keep us full*”. Others simply affirmed that tensions would arise from their shared hedonic liking of animal products and a reluctance to forgo these products: *“we like meat products”, “neither of us want to do it”, “we eat meat a lot and enjoy it”, “we both enjoy meat-based meals, we would not want to change this”.*

There were 87 instances whereby participants anticipated that tensions would arise *asymmetrically* or predominantly from one party, typically the partner and male counterpart. In fact, 72% of responses where the partner was anticipated to be the principal source of tension, the partner was male. In these instances, it was often expressed that this anticipated tension would derail the (female) participant’s own desire to reduce animal foods: *“My partner* [male] *would prefer meat and I* [female] *would want to reduce”; “my husband loves meat too much whereas I* [female] *enjoy meals without meat but I have to make sure meat is served most days”.* Male participants who anticipated being the main source of tension, often spoke of their own hedonic liking of animal foods and their personal reluctance to reduce their consumption: *“I* [male] *love meat”,* *“I* [male] *enjoy meat, so I would be disappointed if was further reduced.”* Further exploratory quantitative analysis corroborated this finding: participants with a male partner anticipated greater tension (*M*= 2.3, *SD*= 1.6) than participants with a female partner (*M*= 2.1, *SD*=1.3), *t*(482.78) = 2.111, *p* =.035, *d* = .19, 95% CI [.02, .53].

A number of additional, qualitative responses added further insight as to why we find a gender difference amongst these data—including beliefs about male partners’ attachment to meat and their commitment to traditional values. Practical concerns that arise when cooking for two people was the most common barrier reported for asymmetric couples, followed by emotion and finances. See Supplemental Materials G for elaboration on these points.

**4. Discussion**

The present study explored how the relational climate of cohabiting meat-eating couples relates to their current dietary practises and openness to reduce their consumption of animal products. This study advances current knowledge by probing the relational dynamics that modulate consumers’ willingness and perceived ability to practice a more plant-forward diet. Below, we discuss the key findings and consider their practical application.

* 1. **Key findings and applications**

One novel insight involves the attitudes of dietary matched and unmatched couples towards meat reduction. Couples who were matched in their dietary orientation tended to report greater levels of food coordination and harmony than unmatched couples. However, at the same time, they were less open to plant-forward dietary transitions and anticipated. One potential interpretation of this finding relates to the inevitable disruption caused by a partner transitioning to a meat-reduced diet. In our methods we had couples consider the asymmetric situation of one member reducing their consumption of animal products. One way to interpret our findings is that matched couples are less willing to disrupt the dietary harmony that they have worked to generate, whereas unmatched couples are less resistant because they are already engaged in managing dietary non-alignment. The qualitative responses confirmed this interpretation and further illuminated the concerns participants had with animal-product reduction. These initial findings have important implications for plant-based advocacy. It is important to recognise that plant-forward dietary transitions will often be perceived by couples as relationally disruptive, since they require individuals to reconfigure how they relate to their partner’s eating patterns. This will be less of a concern for individuals transitioning outside of a relational context.

Some participants recognised that relational tension would come from both members of the relationship, typically due to a hedonic liking of animal products or due to concerns about the appetitive and emotional consequences of plant-based diets (e.g., being frustrated, “hangry”, missing out). Thatindividuals rationalise their continued consumption of animal foods for the gustatory pleasure and perceived nutritional benefits aligns with two of the 4Ns of meat justification (Piazza et al., 2015). Other participants recognised themselves, or their partner (typically a male partner), as the isolated source of anticipated relational tension and a barrier to personal reduction. Many couples feared that transitioning would place strain on the relationship due to negative impacts on their own wellbeing or that of their partner. These strains concerned additional practical, emotional, and financial pressures, such as the need to cook two separate meals, the added costs, and the responsibility falling on one person.

Surprisingly, perhaps, it is those couples who do not share the same eating habits or dietary goals who may be most open to reducing their consumption of animal products. We suspect that this may be the case for a number of reasons. It is likely that unmatched couples have already-established work arounds for the practical, emotional, and financial barriers that matched couples report. For example, it may be the case that couples who are unmatched presently, are more practiced in managing differences in their eating habits and have a pre-established culture of independence when it comes to food and possibly other behaviours.

With regards to relational climate, we found evidence to suggest that cohesive couples are more aligned in their dietary goals and subsequently experience less tension around food choices. Specifically, more cohesive couples reported greater food coordination and dietary harmony, and lower scores of diet-related tensions. Similarly, greater overall flexibility related to higher scores of coordination and harmony, and lower scores of diet-related tensions. Yet, contrary to our expectations, relational cohesion was not an important marker for predicting openness to dietary transitions or concerns about the tensions such transitions might precipitate.

By contrast, relational flexibility was negatively related to tensions anticipated by a member reducing their consumption of animal products. This suggests that couples with more balanced or egalitarian leadership styles may be better able to handle the inevitable disruption caused by a member transitioning to a plant-forward diet. Arguably, this increased confidence among flexible couples relates to the finding that unmatched couples—i.e., those already practiced in managing idiosyncratic dietary patterns—are more open to further transition. It is important to note, however, that, like cohesion, flexibility was not reliably related to openness to plant-based dietary transitions. We suspect this is because plant-based transitions may require individuals to first overcome the core, hedonic barriers they perceive to accompany animal-product reduction—namely, concerns pertaining to convenience, finance, and health—highlighted in our qualitative analysis.

Individual differences among couples related to age, gender, and political orientation also posed roadblocks to plant-forward transitions. A key theme of our research relates to that of gender and politics. Left-leaning individuals were more open to reducing their consumption of animal foods, consistent with previous findings (e.g., Hodson & Earle, 2018; Rosenfeld & Tomiyama, 2020). Advancing research on this topic we observed how political orientation can interplay with relational systems. Our samples evinced attributes of political homophily (e.g., see Huber & Malhotra, 2017) and political orientation was related to the relational dimension of flexibility. Liberal couples were more likely to report greater levels of chaotic flexibility, which was positively correlated with openness to plant-forward dietary transitions (though this relationship did not hold up in the regression analysis). Olson (2000) explains that chaotic relationships are those which lack clear leadership or where leadership roles may shift. Hence, left-leaning individuals who seek one another for partnership may create a relational climate where a flexible leadership style may facilitate plant-forward transitions.

In terms of gender, we found that male partners represented a large barrier to plant-forward transitions—transitions that women are typically more open to (e.g., see Hodson & Earle, 2018). This may be especially true for couples whereby the male counterpart holds traditional values around food, gender roles and politics. Even in contemporary society, women are still looked to as the primary food preparer in the home (Fielding-Singh, 2017). At the same time, the dietary choices of women are often subordinated to that of their male partner (see Asher & Cherry, 2015). This may be particularly true in the case of meat, which is still socially represented in many cultures as a symbol of masculinity and power (Sobal, 2005). By contrast, we found that couples who are more liberal in their political orientations, and who have more flexible leadership styles, believe that less conflict would arise when making a plant-forward transition. These findings may reflect the adoption of more egalitarian values within these groups, which have been associated with fewer disagreements (Rhoden, 2003) and greater willingness to compromise on food choices (Brown & Miller, 2002).

* 1. **Limitations**

This research was limited to mostly cis-gendered, heterosexual couples, which constrains the generalisability of our conclusions. LGBTQA+ individuals represented a small proportion of our sample, and so we were unable to explore how relational climate might interact with couples’ sexual orientation or more diverse gender identities. Our inferences about openness to plant-forward diets and resultant tensions are based in relational dynamics that may not extend to LGBTQA+ relationships. The underrepresentation of minority perspective is a wider issue in the literature on animal-product consumption which deserves greater attention. We see future research with LGBTQA+ individuals as a fruitful space for new explorations into the interplay between relational climate and meat consumption.

Our research was also limited in the sense that it looked only at *attitudes* towards dietary change, specifically an openness to plant-based diets, as opposed to measuring *behavioural* outcomes. Although attitudes can be used as a proxy for estimating behavioural change, these estimations ought to be interpreted with caution, as intentions to change do not always convert to behaviour (Webb & Sheeran, 2006). A recent review estimated that roughly 64% of all research on meat consumption has employed attitude-centric outcomes to estimate behavioural change (Harguess et al., 2020). Hence, future work ought to build upon this initial, foundational research and consider how relational climate impacts on how couples behaviourally pursue and manage plant-forward dietary transitions. Our conclusions are also limited by having only sampled one member of the relationship, as opposed to both parties. Here we must note that, as per Olson (2000), multi-person assessments of family and relational systems are preferable because family members and partners may not concur in their judgements of relational quality or in their attitudes and behaviours. Thus, to provide a more complete picture of the relational system, future work should strive to capture both perspectives.

**5. Conclusion**

The present study of the relational climate of cohabitating couples yielded novel insights regarding why many consumers are apprehensive about plant-forward dietary transitions and the relational variables predictive of a willingness to change. Dietary matched couples were less willing than unmatched couples to transition for fear it would disrupt the harmony already established in their shared consumption practices. Couples with more flexible leadership styles, with left-leaning political views, and where partners (men in particular) were less hedonically attached to meat, anticipated less tension from such transitions, and, on the whole, were more open to them, though not without concerns. These findings highlight how flexible leadership and the demographic makeup of a relationship can help facilitate receptivity to healthier, more sustainable diets.

**Author contributions**

The first author collected the data, conducted the analysis, and wrote the manuscript. The second author contributed to writing and editing of the manuscript. Both authors read and approved the final version of the manuscript.

**Funding**

This research was funded by a doctoral studentship made possible by the Economic and Social Research Council and Greenpeace International.

**Ethical statement**

Ethical approval for this research was obtained from the Faculty of Science and Technology Research Ethics Committee at Lancaster University (FST-2022-0705-RECR-3) on 31st March 2022.

**Declaration of competing interest**

None.

**Open research statement**

This research was pre-registered (AsPredicted: #93437) available here: <https://aspredicted.org/fu3td.pdf>). An anonymised version of the data, as well as all Supplementary Materials can be obtained from: <https://osf.io/gb79m/>.

**Acknowledgments**

The authors would like to acknowledge Bogna Liziniewicz and Chloe Kitis for their helpful insights and contributions to the development of the qualitative research reported in this manuscript.

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**Supplementary Materials for:**

**Relational climate and openness to plant-forward diets among cohabitating couples**

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**Supplementary Materials A**

**Reduced and eliminated products: Descriptive statistics**

Table S1 presents the descriptive statistics for all reduced and eliminated products. Of the seven animal-derived products that participants were asked to consider, the greatest majority reported having eliminated seafood, followed by red meat, fish, white meat, dairy milk, eggs, and dairy cheese. There was a slight deviation in the elimination pattern of partners, who were reported as having eliminated animal products in the following order of frequency: seafood, fish, red meat, dairy milk, white meat, eggs, and dairy cheese. The mean scores for products actively being reduced were highest for red meat followed by white meat, dairy milk, dairy cheese, seafood, fish and eggs. These patterns of reduction were comparable amongst partners.

**Table S1**

*Animal products reduced and eliminated by participant and partner*

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Eliminated | Reducing |
| Participant |  | Frequency  | Percentage | Mean | SD |
| Red meat | 48 | 9.7% | 3.28 | 2.08 |
| White meat | 32  | 6.5% | 2.09 | 1.58 |
| Fish | 46  | 9.3% | 1.55 | 1.13 |
| Seafood | 127  | 25.6% | 1.65 | 1.28 |
| Dairy milk | 29 | 5.8% | 1.78 | 1.50 |
| Dairy cheese | 11 | 2.2% | 1.71 | 1.39 |
| Eggs | 14 | 2.8% | 1.40 | 1.01 |
|  | Red meat | 47 | 9.5% | 2.88 | 2.08 |
|  | White meat | 24 | 4.8% | 1.96 | 1.58 |
|  | Fish | 51  | 10.3% | 1.51 | 1.16 |
| Partner | Seafood | 120  | 24.2% | 1.60 | 1.27 |
|  | Dairy milk | 29 | 5.8% | 1.81 | 1.61 |
|  | Dairy cheese | 14 | 2.8% | 1.73 | 1.50 |
|  | Eggs | 20 | 4% | 1.39 | 1.05 |

**Supplementary Materials B**

**Relational climate: FACES-IV Scale (Olson, 2011; adapted for couples)**

(All items rated 1-5, where 1=strongly disagree, 5=strongly agree).

**Cohesion**

**Balanced items**

My partner and I are involved in each other’s lives

My partner and I feel very close to each other

My partner and I are supportive of each other during difficult times.

My partner and I consult each other on important decisions.

My partner and I like to spend our free time with each other.

Although My partner and I have individual interests, we still participate in activities together.

My partner and I have a good balance of separateness and closeness.

**Disengaged items**

We get along better with people outside our relationship.

My partner and I seem to avoid contact with each other when at home.

My partner and I know very little about each other’s friends.

We are on our own when there is a problem to be solved.

My partner and I seldom do things together.

My partner and I seldom depend on each other.

My partner and I mainly operate independently.

**Enmeshed items**

My partner and I too much time together.

My partner and I feel pressured to spend most free time together.

My partner and I are too dependent on each other.

My partner and I have little need for friends outside our relationship.

We feel too connected to each other.

We resent doing things outside our relationship.

We feel guilty if they want to spend time away from each other.

**Flexibility**

**Balanced items**

We try new ways of dealing with problems.
We equally share leadership in our relationship.
Discipline in our relationship is balanced.
My partner and I are able to adjust to change when necessary.
We shift household responsibilities from person to person.

We have clear rules and roles in our relationship.

When problems arise, we compromise.

**Rigid items**

There are strict consequences for breaking the rules in our relationship.
There are clear consequences when either of us does something wrong.

We have a rule for almost every possible situation.
Our relationship is highly organized.
Our relationship becomes frustrated when there is a change in our plans or routines.

It is important to follow the rules in our relationship.
Once a decision is made, it is very difficult to modify that decision.

**Chaotic items**

We never seem to get organized in our relationship.
It is hard to know who the leader is in our relationship.
Things do not get done in our relationship.
It is unclear who is responsible for things (chores, activities) in our relationship.
There is no leadership in our relationship.
We have a hard time keeping track of who does various household tasks.

We feel hectic and disorganized.

**Supplementary Materials C**

**Openness to reduce by animal product descriptive statistics**

When asked to consider how open they would be to reducing their consumption of seven animal-derived food products, participants reported being most open to reducing their consumption of red meat, followed by seafood, white meat, fish, dairy milk, dairy cheese and eggs. See Table S2 for means and standard deviations.

**Table S2**

*Openness to reduce by animal product*

|  |  |  |
| --- | --- | --- |
|  | Mean | SD |
| Red meat | 4.50 | 2.03 |
| White meat | 3.48 | 2.00 |
| Fish | 3.31 | 1.96 |
| Seafood | 3.50 | 2.03 |
| Dairy milk | 3.29 | 1.96 |
| Dairy cheese | 3.01 | 1.87 |
| Eggs | 2.80 | 1.81 |

**Supplementary Materials D**

**Code prevalence**

Both coders agreed on 87 instances where participant had indicated that should tension arise it would come predominantly from one party, and 77 instances where the anticipated tension was attributed to both parties. Thus, where it was clear that the anticipated tension was being ascribed to a source (*N*=164), it was slightly more common for participants to report that anticipated tension would arise from one party (e.g., 53%) than both (e.g., 47%). Of the reported barriers that coders came to an agreement on, the most frequent reported as an explanation for anticipated tension were of an emotional (*N*=116) or practical (*N*=92) nature, with fewer responses reporting health (*N*=17), financial (*N*=8) and social (*N*=8) barriers. We discuss these themes in greater depth in Supplemental section G.

**Supplementary Materials E**

**Dietary transition descriptive statistics**

Of the 21 participants who were transitioning (4.2%), ten were omnivores (47.61%), five were semi-vegetarians (23.81%), four meat lovers (19.05%) and two lacto- or ovo-vegetarians (9.52%). Of the ten omnivores who indicated that they were transitioning to another dietary classification, nine indicated that they were pursuing a semi-vegetarian diet (90%) and one a pescatarian diet (10%). Of the five semi-vegetarians, one participant indicated that they were pursuing a more restrictive semi-vegetarian diet (20%); a further three participants were pursuing a pescatarian diet (60%) and one a lacto- or ovo-vegetarian diet (20%). Of the four meat lovers, half were pursuing an omnivorous diet (50%), and the other half a semi-vegetarian diet (50%). The two lacto- or ovo-vegetarians were each pursuing a strict vegetarian (50%), or lifestyle vegan diet (50%). Ten of these 21 participants indicated that their partner was also in the process making a dietary transition, of which eight cases were matched in terms of the dietary classification that they were each pursuing.

 Of the 20 participants who indicated that their partner was pursuing a dietary transition (4%), ten were omnivores (50%), four meat lovers (20%), four semi-vegetarians (20%) one a lacto- or ovo-vegetarian (5%) and one a dietary vegan (5%). Of the ten omnivores who indicated that they were transitioning, eight indicated that they were pursuing a semi-vegetarian diet (80%), one a pescatarian diet (10%) and one a lacto- or ovo-vegetarian (10%). Of the four meat lovers, three were pursuing an omnivorous diet (75%), and one a semi-vegetarian diet (25%). Of the four semi-vegetarians, one participant indicated that they were pursuing a pescatarian diet (25%), two a lacto- or ovo-vegetarian diet (50%) and one a dietary vegan (25%). The one lacto- or ovo- vegetarian was pursuing a lifestyle vegan diet, while the one dietary vegan was pursuing a less restrictive pescatarian diet.

**Supplementary Materials F**

**Dietary characteristics of matched and unmatched couples (dietary classifications)**

In terms of current dietary classification, 334 participants were matched with their partner and 162 were unmatched. Of those unmatched couples, we further explored the extent to which participants and their partners were following different diets. To do this we used responses to the dietary classification scale and looked at the difference in the number of data points between participants and their partners. Here we see that, amongst unmatched couples, the vast majority of participants (*n*=108, 66.67%) report that their partner sits just one dietary classification away from them (e.g., an omnivore and a semi-vegetarian). Far fewer participants reported greater disparities. See Table S3 for counts.

**Table S3**

*The magnitude of the difference in dietary classification between unmatched couples*

|  |  |
| --- | --- |
| Number of data points between dietary classifications | Frequency |
| 1 | 108 |
| 2 | 38 |
| 3 | 12 |
| 4 | 3 |
| 5 | 1 |

To explore the characteristics of couples based on their reported dietary classifications, we conducted another set of independent t-tests with the same adjustment of alpha that we had applied in our t-test analysis of perceived matching (i.e., *p* = .05/5 = .01), but this time we used the classification groupings. We found that matched couples reported significantly greater food coordination than unmatched couples, *t*(494) = 6.30, *p*< .001, *d* = .603, 95% CI [.411, .794]. Unlike what we saw with perceived matching, we found no significant difference in dietary harmony between matched and unmatched couples, *t*(494) = 2.46, *p*= .014,  *d* = .235, 95% CI [.047, .423]. We found no difference between matched (*M*rank = 241.26) and unmatched couples (*M*rank = 263.43)on current diet-related tension, *U* = 24635.00, z = 1.87, *p* = .062, 95% CI [.06, .07]. We found no significant difference between matched and unmatched couples on openness to plant-forward transitions, *t*(494) = -2.02, *p*= .044, *d* = -.193, 95% CI [-.381, -.005]. Lastly, we found no difference between matched and unmatched couples in anticipated diet-related tension, (*t*(494) = 1.41, *p* =.159, *d* = .135, 95% CI [-.053, .323]. See Table S4 for all means and standard deviations.

**Table S4**

*Dietary characteristics of couples matched and unmatched by dietary classification*

|  |  |  |
| --- | --- | --- |
|  | Matched | Unmatched |
| Food coordination | 5.4a (0.9) | 4.9b (1.0) |
| Dietary harmony | 5.6a (1.2) | 5.3b (1.3) |
| Current diet-related tension | 1.6a (1.0) | 1.7a (1.1) |
| Openness to plant-based dietary transitions | 3.4a (1.6) | 3.7a (1.6) |
| Anticipated diet-related tension | 2.3a (1.5) | 2.1a (1.4) |

**Supplementary Materials G**

**Additional qualitative analysis**

Many participants attributed their anticipated tension to their partners’ hedonic liking of meat (“*my partner* [male] *loves meat”*),or the belief that the consumption of meat is essential to a man’s survival (*“because my partner can’t live without meat. He can never survive on a vegetarian diet”*). Others further suggested that this hedonic liking may relate to the endorsement of familiar meal-time constructs or *“proper”* meals (e.g., see Marshall & Anderson, 2002): *“because my partner likes to have meat with pretty much every main meal”*, *“my partner believes the symbolism of meat and two veg and it’s hard to detract him from this, it can be a battle if there is less meat on his plate”.* In a similar vein, some participants attributed their (male) partner’s reluctance to their steadfast commitment to “traditional” values: *“I* [female] *am more open to dietary change than my husband as he is more traditional and set in his way*s*”*, *“because my husband can be rather stuck in his ways”, “my husband is much less flexible with food than I am* [female]*”.* Several responses conveyed the notion, and resentment, thatwomen’s food choices are subordinate to that of their male partners: *“Because Hubby would object to any changes, and I* [female] *would be the scapegoat”*, *“my husband likes food and he likes eating food of his choice, he really enjoys red meat and meat products. I* [female] *used to be a vegetarian and gave up because of this”.*

Practicality was the most common barrier reported, particularly amongst those participants who anticipated asymmetric tension. Commonly reported practical issues included the need to cook multiple or different meals (i.e., *“We would have to cook separate meals”*). Participants also anticipated there would be costs experienced on three dimensions: emotional (*“It would be harder to cook separate things for both of us so I would be more stressed”*)*,* temporal(*“it would make it harder to eat the same meals - we'd end up having to cook separate meals which we really don't have time or money to do”*), and financial (*“This could mean having to make two meals at mealtimes and may mean higher shopping bills”*). Such consequences were often expected to fall on the female counterpart (e.g., *“Because it would be difficult to think up new recipes to use regularly and the burden would probably land on me* [female]*”*)*.* One male participant concurred: *“not being able to eat the same foods would cause more cooking to be done by my partner* [female] *causing stress”.* A common perception was that eating plant-based is more difficult than eating an animal-based diet, partly due to having to break old habits (“*I prefer that we eat the same food as it is easier to prepare”*), but also the extra cognitive load of finding plant-based alternative products to meat (*“it may be difficult to find alternative ingredients that are tasty enough to warrant the change”),* developing meat-free recipes (*“The stress of coming up with suitable recipes”*),and finding vegetarian alternatives when eating outside of the home (*“we won't be able to eat or go to the same restaurants/takeaways anymore”*). These constraints were thought to be particularly taxing in social settings (*“Eating out with friends or inviting people over would be more stressful”).*

**References in Supplements**

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1. The vast majority of the sample (*n* = 442, 89.1%) indicated that they had been in a relationship with their partner for five years or more, 50 indicated that they had been with their partner between 1-5 years (10.1%), and four were together less than year (0.8%). [↑](#footnote-ref-1)
2. Cohesion (Skewness = -2.50, *SE* = .11), balanced cohesion (Skewness = -3.48, *SE* = .11) and tension (Skewness = 2.25, *SE* = .11) failed to meet thresholds for normally distributed data (i.e., *Skewness* ±2; George & Mallery, 2010) and, as such, we adopted non-parametric alternative tests where appropriate. [↑](#footnote-ref-2)
3. Since classifications and perceptions were at times misaligned, we made the decision to explore both of these variables in relation to our outcome variables. This decision was made post data collection and therefore fell outside of our pre-registered analysis plan. [↑](#footnote-ref-3)