Navigating the Discomfort of Change: Perceptions and Experiences of Reducing Meat And/or Dairy Consumption

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Abstract

Across three projects, I aimed to explore the role of habits, social norms, and identities in the transition towards reducing one's meat and/or dairy consumption from a self-control perspective and what other factors promote or hinder reduction efforts. I also aimed to examine perceptions of vegans, through stereotypes and meta-stereotypes about vegans, to examine how these influence people's motivation to maintain dietary changes and their experiences of reduction more broadly.

In Chapter 2, I reported a qualitative survey study with 80 meat and/or dairy reducers who predominantly held environmental motives for reducing. Through open-ended questions, I explored the role of habits, identity, and social norms, from a self-control perspective and analysed the data using reflexive thematic analysis.

In Chapter 3, I conducted a quantitative survey through two studies to assess whether vegans (N = 200) and reducers (N = 272) hold stereotypes about vegans and believe that omnivores stereotype vegans (meta-stereotypes). I assessed whether meta-stereotypes were associated with vegan identity, vegan's outgroup regard of omnivores, and explored the strongest predictor of maintaining a vegan diet. I also examined whether negative meta-stereotypes were associated with the motivation to maintain dietary changes.

In Chapter 4, I analysed responses from five open-ended questions as part of Study 2 of Chapter 3 (N = 272) using reflexive thematic analysis. These questions related to perceptions from participants on the most important barrier to their reduction efforts. Questions also related to perceptions of vegans that participants, and others in their social circle, held, and how these perceptions influenced them or others who are reducing their meat and/or dairy consumption.

Overall, findings from empirical chapters suggest that situational cues triggered conflicting experiences, including motivational, cognitive, and affective conflict. When conflict was detected, this often prompted the need for self-control and

motivations to control efforts. Additionally, holding negative meta-stereotypes reflected social polarisation. I did not find evidence that meta-stereotypes were linked to people's motivation to maintain dietary changes, yet initial evidence pointed to meta-stereotypes playing a role in choices of identity labels. Finally, I highlighted the complex interplay of factors that underlie reducing meat and/or dairy consumption, from people's psychological capability (e.g., self-control) or internal cues (e.g., habits), motivations (e.g., desires and goals that are often incompatible) as well as opportunity from the social or physical environment (e.g., social pressure, availability) that influence avoiding consuming meat or dairy depending on situation in which the behaviour is performed.

In Chapter 5, I reviewed findings from previous chapters, linking my findings to the wider theoretical frameworks in behavioural and identity research, such as grounded cognition theories of desire and motivation as well as the unified model of vegetarian identity. I also suggested practical implications, limitations, and future directions that would support the transition to consuming less meat and/or dairy.

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Acknowledgements

The PhD journey can be a lonely one at the beginning when everything feels uncertain and overwhelming, and especially, when starting the journey with the start of the pandemic. As I write the acknowledgements of my thesis, I chuckle to myself, as I reflect on the memories of frustration, overwhelm, burnout, and the nagging whispers of self-doubt. Yet, amidst these challenges, there were moments of elation and small victories, and the moments of excitement and deep curiosity for learning. Looking back, I realise the growth I have experienced through it all.

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Research Output

Published output:

Chapter 2 - Wehbe, L. H., Banas, K., & Papies, E. K. (2022). It's Easy to Maintain When the Changes Are Small: Exploring Environmentally Motivated Dietary Changes From a Self-control Perspective. *Collabra: Psychology*, *8*(1), 38823. https://doi.org/10.1525/collabra.38823

Preprints:

Chapter 3 - Wehbe, L. H., Duncan, S., Banas, K., & Papies, E. K. (2023a). *Meta-stereotypes and their associations with eating motivation and identity among vegans and meat and/or dairy reducers*. PsyArXiv. https://doi.org/10.31234/osf.io/s54hg

Preprints now under review:

Chapter 4 - Wehbe, L. H., Duncan, S., Banas, K., & Papies, E. K. (2023b). *To stand out or to conform: Stereotypes and meta-stereotypes as barriers in the transition to sustainable diets.* PsyArXiv. https://doi.org/10.31234/osf.io/3a64d

Contribution Statement

Below are contribution statements for each chapter of this thesis. Contributions are listed following the Contributor Roles Taxonomy (CRediT) format.

Key

LW: Lara Wehbe; EKP: Esther K. Papies; KB: Kasia Banas; SD: Sophie Duncan

Chapter 1

LW: Conceptualisation, Methodology, Investigation, Resources, Writing – Original draft, Writing – Review & Editing. EKP: Investigation, Resources, Writing – Review & Editing, Supervision. KB: Investigation, Resources, Writing – Review & Editing, Supervision.

Chapter 2

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Chapter 3

Study 1

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Abbreviation

United Kingdom (UK)

Capability-Opportunity-Motivation-Behaviour (COM-B)

Intergovernmental Panel on Climate Change (IPCC)

Unified Model of Vegetarian Identity (UMVI)

Open Science Framework (OSF)

R Markdown (Rmd)

1 Chapter 1: General Introduction

"*The wonderful thing about food is that you get three votes a day. Every one of them has the potential to change the world*". (Nourish, 2020b)

1.1 Introduction

Everyday eating behaviours are deeply shaped by cultural norms and traditions (Lindeman & Sirelius, 2001). Particularly, behaviours such as the consumption of meat and dairy products, which has important cultural and social value attached to it, significantly contributes to the current climate change crisis, causing health and environmental effects. The food choices people make regarding what they consume, such as choosing diets rich in meat and dairy, are influenced by, and ripple through, the broader social, economic, and ecological fabric of our world (Barton et al., 2015; Chen & Antonelli, 2020a). In fact, the modern food system has made meat and dairy so widely accessible that they have become ingredients contained in countless food products. There is growing demand for meat and dairy (Falcon et al., 2022), and people in industrialised countries are consuming meat beyond the recommended nutritional limit suggested by public health research, which is 500g of meat per week (World Cancer Research Fund, 2018). An expected increase in the global population in the next 30 years will likely have an impact on the demand of meat and dairy foods (Hayes et al., 2017). Overconsuming foods, such as meat and dairy, may negatively impact human health (Machovina et al., 2015; Nestle, 1999) and have detrimental effects on the sustainability of the planet (Alae-Carew et al., 2022; Vermeulen et al., 2012).

Behaviour change is a central component that can help mitigate the detrimental effects of unsustainable practices and environmental degradation on human health and the climate (Whitmarsh et al., 2021). However, the behaviour change of avoiding meat and dairy can pose a challenge for individuals accustomed to habitually consuming these foods. In most cases, consuming meat and/or dairy is a recurrent and contextual behaviour that takes place in social (e.g., eating with family) as well as non-social (e.g., eating alone) situations. It is important to understand what hinders people's efforts to reduce the intake of these foods,

how people's perception of the world around them guides their thoughts, behaviours, and how others influence people transitioning to a more sustainable diet. Social psychology plays a crucial role in understanding the cognitive and behavioural mechanisms that underpin behavioural changes. Through the lens of social psychology, researchers can shed light on the implications of dietary changes, specifically the pressing demand to reduce the consumption of meat and dairy products addressed by the Intergovernmental Panel on Climate Change (IPCC) in 2022. There is an urgent need for behavioural shifts at both individual and societal levels. In a world facing the formidable challenges of climate change, resource scarcity, and growing concerns about public health, the intervention of social psychologists becomes indispensable.

1.2 Thesis Aims and Research Questions

The primary objective of this thesis is to offer insights into the social and psychological mechanisms that play a role in reducing meat and/or dairy intake, and therefore, transition towards consuming more sustainable diets. Firstly, I aimed to explore how environmentally motivated meat and/or dairy reducers, or individuals who reduce their meat and/or dairy consumption, experienced this dietary shift from a self-control perspective. This was done by exploring the mechanisms and processes involved in self-control that contribute to how people regulate their impulses and manage their choices (Kotabe & Hofmann, 2015). Secondly, I explored the social mechanisms and perceptions of vegans, to understand how meta-stereotypes of vegans from both vegans and meat and/or dairy reducers were linked to the motivation to maintain a dietary change. Finally, I explored how meat and/or dairy reducers perceive vegans and how their beliefs about what others think of vegans plays out in their lived experiences. I examined a social cognitive process, namely the beliefs of what an outgroup thinks of vegans, to understand how these processes guide thoughts and behaviours. I outline the general research questions are below:

1) How do people perceive and experience the transition towards more sustainable eating behaviours? What are the barriers and enablers to this dietary transition?

2) Does shifting towards and maintaining sustainable eating behaviours require self-control?

3) What are the roles of identities, habits, social norms, and meta-stereotypes of vegans in the motivation to maintain a reduced meat and dairy diet?

1.3 Definitions of Dietary Labels

Before delving into the main body of this Introduction, I would like to lay out some definitions. Throughout this thesis, I will refer to various dietary groups, such as vegans, vegetarians, omnivores, and meat and/or dairy reducers. These dietary classifications can be based on the progressive degree to which animal based foods are avoided (Beardsworth & Keil, 1991). Vegans are individuals who exclude all animal products from their diet while omnivores include these foods (Hargreaves et al., 2023), and therefore are on opposite extremes of the vegan-omnivore continuum of eating behaviours. Vegetarians are individuals who exclude meat and meat-derived foods, yet include other animal products (e.g., eggs and dairy) to different degrees (Hargreaves et al., 2023). However, consuming a vegan or vegetarian diet goes beyond what people consume. Veganism and vegetarianism are social categories that incorporate a social identity, and include social values and norms specific to their groups (Rosenfeld & Burrow, 2017; Vestergren & Uysal, 2022). Moreover, how individuals identify themselves with regard to their diet may not always align with people's consumption levels. For example, some individuals that identify themselves as vegetarians, as well as vegans, may occasionally consume meat (Rosenfeld & Tomiyama, 2019). Social identities can form around specific actions or behaviours and/or from shared beliefs or principles.

Aligning with the aims of this thesis; to understand the behaviour change around consuming less meat and/or dairy; I have defined meat and/or dairy reducers as individuals trying to reduce their meat and/or dairy consumption, hereafter referred to as reducers. Understanding these shared behaviours could shed light on how reducer's social identity form, as shared behaviours within a group can lead to the formation of social identity (see Vestergren et al., 2019). Notably,

people who attempt at reducing their meat intake might still label themselves as omnivores and align with ideologies of consuming meat known as carnism (Joy, 2020). The reducers classification can encompass different groups, such as omnivores, flexitarians, and vegetarians, provided that reducers are actively trying to reduce their meat and/or dairy consumption. In this thesis, I focus attention on levels of meat and/or dairy consumption while considering other aspects of reducers' experiences of reducing these foods.

1.4 Introductory Chapter Overview

In this first, introductory, chapter, I argue the importance of examining the dietary transition of reducing meat or dairy intake, and the psychological factors that may play an important role in reducing meat and dairy consumption. In Section 1.5, I highlight the levels of unsustainability of the current food system and the urgent need to transition to more sustainable diets, by reducing meat and dairy consumption, as a way to mitigate the detrimental impact on the climate, as well as to minimise the potential negative impact on health. This change is required on both an individual and system level. I explain how understanding the determinants of this behaviour change can inform what changes are needed in the system, and what model I used to inform these recommendations. In Section 1.6, I highlight that eating meat and dairy is a habitual behaviour and reducing meat and/or dairy intake requires changing habits. I discuss how this behavioural change may require self-control, as well as introducing the relevant self-control and behavioural maintenance theories to further ground our understanding of such processes. In Section 1.7, I discuss how eating behaviours are social processes that reflect social identities, how stereotypes and meta-stereotypes could play an important role in transitioning to a reduced meat and/or dairy diet, and highlight the social identity theories that underpin these social processes.

In this Chapter, I will introduce theories and models that are well suited to understanding the phenomenon at hand. These include: the COM-B model (Michie et al., 2011) to help define the psychological factors that underpin reducing meat and dairy consumption, as well as the grounded cognition theory of desire and motivated behaviour (Papies, Barsalou, et al., 2020) and the social

identity approach (Abrams & Hogg, 1990) as best suited theoretical frameworks to support the integration of my findings. Other relevant theories are acknowledged. The dual system models on the two systems that regulate behaviour: the impulsive (e.g., quick and spontaneous) processes and the reflexive ones (e.g., slow and deliberate) (Hofmann, Friese, et al., 2008), the Unified Model of Vegetarian Identity (UMVI; Rosenfeld & Burrow, 2017) on dietary identities that are motivated by an interplay of motivational factors, Cognitive dissonance theory, such as the work of Festinger, (1957), as well as the meat paradox (Bastian & Loughnan, 2017), or vegan paradox (De Groeve & Rosenfeld, 2022) are all well-suited frameworks that provide a conceptual foundation, to interpret observations and draw predictions from the findings of my thesis. I do not provide a comprehensive coverage of all the relevant theories as this is beyond the scope of my Introduction.

1.5 Climate Crisis and the Urgent Need for Sustainable Diets

1.5.1 The Current State and Potential of Food Systems

Food systems hold the potential to widely promote human health and the sustainability of the planet. The system's reliance on resource-intensive production methods, such as intensive livestock farming and agriculture, excessive water and land use, as well as unsustainable farming methods and chemical inputs poses a substantial threat to ecosystems, biodiversity, and the long-term sustainability of the planet (Clark et al., 2020; Shukla et al., 2019; Willett et al., 2019). These widespread effects, such as floods, heatwaves, or land drought, are expected to impact communities across the globe, with especially devastating effects on low-income communities with limited capacity for adapting to such devastating events (Leichenko, 2011; Membele et al., 2022). The current food sector contributes to approximately one third of global greenhouse gas emissions (Crippa et al., 2021) whilst it is evident that the current food system is unsustainable and requires urgent changes.

One considerable change to the food system is lowering the demand for and production of foods with detrimental environmental effects. Reducing the production and demand for meat and dairy aligns with the EU pledge to decrease

greenhouse gas emissions by more than 55% by 2030. In line with existing research emphasizing the interconnectedness of environmental and health issues (Inauen et al., 2021), I stress the importance of recognising their inseparable nature. Embracing individual health cannot, and must not, be separated from the health of our planet. Lowering the production and demand for meat and dairy requires not only radical transformations within the food system, which have proven to be challenging, but also individual actions.

Shifting diets to less meat and dairy consumption offers numerous environmental benefits. Studies have shown that eating a plant-based diet ranks among the top four high-impact personal actions for reducing greenhouse gas emissions across the industrialised world, saving 0.8 tonnes of CO2 equivalent per person per year (Wynes & Nicholas, 2017). Despite the significance of measuring emissions, researchers highlight the need to expand conventional views on climate change and health, which often narrowly focus on emissions and direct climate impacts (Deivanayagam & Osborne, 2023). Instead, encompassing alternative economic paradigms and addressing broader systemic issues, such as economic structures and societal equity, would promote fairer and healthier futures across the globe (Deivanayagam & Osborne, 2023).

One study underscores the potential for transformative changes in the food and land system, not only to mitigate greenhouse gas emissions but also to enhance human well-being and environmental sustainability through efficient resource allocation and dietary shifts (Bodirsky et al., 2022). Researchers assessed degrowth over time, a movement challenging the traditional growth model of economics that prioritises material consumption often at the expense of environmental degradation and social inequalities. By 2050, researchers predicted that consuming less meat as part of a degrowth pathway would lead to 6.93 gigatonnes of carbon dioxide (CO2) equivalent emissions mitigation, due to shifts in demand on the land and away from animal production. Such shifts would facilitate afforestation, the regrowth of natural vegetation, and sustainable land use, resulting in improvements in food security for vulnerable populations and negative CO2 emissions (Bodirsky et al., 2022).

Therefore, shifting diets towards reduced meat and/or dairy consumption is not only a high-impact personal action but also offers a pathway towards degrowth, aiming to achieve ecological sustainability, social equity, and improved quality of life.

1.5.2 How to Understand Behaviour Change for Practical Change

Behaviour change has been understood as action taken on an individual level (e.g., reducing meat and/or dairy consumption). Over the past two decades, awareness and concern for our climate's degradation have been on the rise across the world, partially due to the recent rise of climate movements, like the Fridays for Future school strikes started by Swedish activist Greta Thunberg (Sorce, 2022). There is great potential for mitigating the devastating effects of the food sector if people reduce their meat and dairy consumption (Dagevos, 2021; Raphaely & Marinova, 2014).

The Climate Change Committee, an independent, statutory body established under the UK's Climate Change Act 2008, which aims to provide advice to the UK government on climate change issues, published a report which reviewed the effectiveness of different interventions to promote low-carbon behaviours in eight key areas (Mitev et al., 2023). One of the recommendations was that individuals in the United Kingdom need to reduce consumption of high-carbon foods such as meat and dairy. Global meat consumption continues to increase and is expected to rise in the coming years (Desiere et al., 2018) and a movement, known as the carnivore diet, is gaining popularity (Kirwan et al., 2022; Lennerz et al., 2021). At the same time, the United Kingdom (UK) has observed a large increase in veganism; the vegan population has quadrupled between 2014 and 2018 (Statista, 2020), and food companies have launched more vegan products in the UK than in any other nation (Mintel, 2019). Nevertheless, negative beliefs and attitudes towards veganism and adopting a vegan diet (Bryant, 2019) linger in the UK, and may act as barriers to people's willingness to reduce or eliminate meat or dairy consumption. Behavioural change in the context of reducing meat and/or dairy consumption must therefore be examined at an individual level.

Behaviour change can also be understood within the social system in which the individual operates, through the many roles that lay outside of just being a consumer (Whitmarsh et al., 2021). For example, Donald Watson and a group of like-minded individuals in the United Kingdom created the Vegan Society, and aimed to promote diets that exclude animal products, marking the beginning of the modern vegan movement in the world (Wrenn, 2019). The Vegan Society has played a role in raising awareness about veganism and advocating for its ethical, environmental, and health-related benefits. Viewing the individual as a central component of the social system (Sniehotta et al., 2017) would offer valuable insights to the phenomenon at hand, however remains outside of the scope of my thesis. I started with the question, "how can we encourage the reduction of meat and/or dairy consumption?", and examined the individual's physical and psychological capabilities, their motivation, as well as the environment in which they operate.

1.5.3 Behaviour Change on the Individual Level

Researchers have explored what facilitates and hinders people from reducing meat and/or dairy foods (Graça et al., 2019). There is ample evidence that intentions do not necessarily affect behaviour. This phenomenon, known as intention-behaviour gap, has been long studied in social psychology research (e.g., Sheeran & Webb, 2016). Understanding what hinders intentions to translate into action is an important step in grasping the challenges shifting behaviours. Knowledge drives the intention to change behaviour (Kelly & Barker, 2016) and motivational factors, including desires, habits, and social norms, often contribute to the gap between intentions and behaviours (e.g., Papies, 2017; Sheeran & Webb, 2016). Researchers have integrated these factors into an existing overarching framework, known as the COM-B model (Atkins et al., 2017).

The COM-B model describes behavioural determinants that fall into three categories; Capability (C), Opportunity (O), and Motivation (M), which all interact in intricate ways to determine people's behaviour (B) (Michie et al., 2011). Capability refers to an individual's psychological and physical ability to

perform a specific behaviour. It encompasses knowledge, skills, and the capacity to execute the desired action. It also includes the individual's perception and cognitive processes, such as social norms, as well as the ability to regulate behaviour, such as self-control. Opportunity captures both physical and social factors from the environmental conditions that can either enable or hinder the behaviour in question. This includes factors like the physical environment, social influences, and the availability of resources. Motivation, the third component, encompasses the individual's emotional and cognitive processes that drive behaviour, which include habitual processes. Here, I used the model to help understand the factors that promote or hinder the transition to a reduced meat and/or dairy diet.

This framework has been applied across various domains and behaviours (e.g., Barker et al., 2016; Cassidy et al., 2018), including in a recent review in the context of reducing meat consumption (Graça et al., 2019). In the food context, one study found that motivation mediated the relationship between capability and behaviour and capability mediated the relationship between opportunity and motivation (Willmott et al., 2021). Drawing robust conclusions in the context of meat and dairy consumption is challenging due to a predominant focus on variables from the motivational domain in the majority of studies (Graça et al., 2019). Variables from the opportunity domain are addressed to a lesser extent, and with even less attention given to variables from the capability domain (Graça et al., 2019). The COM-B model underscores that behaviour change is intricately shaped by a complex interplay of its three elements, rather than being solely dependent on individual willpower. Whether reducing meat and/or dairy requires self-control remains as yet underexplored. I next highlight the potential role of self-control in this dietary transition.

1.6 The Role of Self-Control in the Transition Towards Consuming Less Meat and Dairy

1.6.1 The Complexity of Choice Management in Reducing Meat and Dairy Intake

Eating meat and/or dairy is a dietary behaviour, and understanding the transition to consuming less meat and/or dairy foods requires an awareness of

other behaviours at play. Gardner et al. (2019) argued for the benefit of breaking higher-order health behaviours into simpler ones. Similar views highlight the importance of accounting for the complexity of behaviours when trying to understand and change behaviour (Phillips & Mullan, 2022). Changing the behaviour of consuming meat or dairy also involves changing various other behaviours, which can be significantly challenging. For example, if an individual adopted the behaviour of buying a meat sandwich after work and recently has aimed to cut down on their meat consumption, they might need to have plant-based foods available at home, the skills to prepare a tasty plant-based sandwich, pack it, and bring it from home. Alternatively, one might need to change the place at which they normally buy their meat sandwich. In such situations, choices arise, and managing the "desired" choices might be challenging. Theories, such as grounded cognition theories, help in understanding how these choices are enacted.

1.6.2 Cognitive Representations of Meat-Based and Plant-Based Foods

The grounded cognition theory of desire and motivated behaviour illustrates the mechanisms underlying motivated behaviours (Papies & Barsalou, 2015), and can be useful to understand people's motivations to consume meat and/or dairy. When a behaviour is performed repeatedly, people encode representations of experiences in their memory (Papies & Barsalou, 2015). These cognitive representations include information about sensory features (e.g., taste, smell, texture), external context (e.g., geolocation, other people present within the social context), internal context (e.g., bodily cues, emotions, thoughts), and motor actions of eating these foods stored in memory as a situated conceptualisation (Papies, Barsalou, et al., 2022; Papies & Barsalou, 2015). Encountering such representations may activate other features of the representation, that are re-experienced, or simulated, as a response to this cue. By simply viewing pictures of rewarding foods, neuro-imaging research shows that areas of the brain involved when people actually consume foods were activated more strongly than when viewing non-rewarding foods (Chen et al., 2016).

Representations may include consumption reward simulations and can trigger the desire and motivation to re-enact the simulated behaviour (Papies, Barsalou, et al., 2022; Papies, van Stekelenburg, et al., 2022). In the context of meat and dairy consumption, experiencing representations of these foods, such as smelling a meat burger at a favourite restaurant, may activate the desire to consume meat burgers, including rewarding experiences of enjoyment of the taste of the burger, and the company of friends when eating the burger. Liking particular foods, denoting the hedonic impact of pleasant rewards, plays an important role in meat and dairy consumption. Such sensory appeal of meat or dairy-based foods can hinder the reduction of these foods (Cardello et al., 2022; Collier et al., 2023). Moreover, when people experience a reward of consuming foods in a situation, the encoding of representations deepens (Papies, van Stekelenburg, et al., 2022). Such deeper encoding may lead consumption and reward simulations to affect behaviour without reaching conscious awareness (Papies & Barsalou, 2015). Consuming meat or dairy, for example on Sundays or for breakfast, may be labelled as habitual when repeatedly performed in these contexts and may be rewarded by previous experiences of enjoyment when consuming these foods.

1.6.3 The Role of Habits in Changing and Maintaining Behavioural Change

Research has highlighted that habits are crucial components to changing and maintaining behaviours (see Papies, Barsalou, et al., 2022). Environmental cues trigger an impulse to act, after repeatedly performing a behaviour in a specific context (Gardner, 2015). Eating behaviour may reflect an automatic response to cues in the situation that triggers impulsive reactions to the desirable features of food (e.g., Wansink, 2010) or may reflect reflective responses (Ajzen, 1991). This is based on dual process models (Hofmann, Friese, et al., 2008) that suggest that behaviour is regulated by both reflective and automatic systems, that may run in parallel and, at times, interacts with each other. Both systems underlie people's dietary patterns, yet one may override the other based on whether individuals are initiating a behaviour or maintaining it over time. This suggests that habits can override intentions to enact a “desired” behaviour, and low motivation to engage in health-related behaviours can override the formation of new habits (Rothman et al., 2009). Additionally, the maintenance model of

behavioural change acknowledges the interplay of conscious and automatic processes in shaping and maintaining behaviour (Kwasnicka et al., 2016), and highlights habit strength, as well as contextual factors, as key factors to behavioural maintenance.

The consumption of meat and dairy is influenced by habits and liking, as most people have frequently consumed these foods from an early age (Papies, Johannes, et al., 2020; van't Riet et al., 2011). To disrupt habitual intake of meat and dairy foods and to support maintaining dietary changes, one must consider the role of the habitual responses of consuming meat and dairy within contexts of different eating environments. To disrupt habitual behaviours and develop new ones, one may exert conscious efforts and self-control.

1.6.4 The Need for Self-Control

Typically, inhibiting habitual behaviours and food desires requires self-control (Adriaanse et al., 2014; van't Riet et al., 2011; Wood & Neal, 2007). Desire is a motivational force as a response to a cue "that is anticipated to be rewarding" (Papies & Barsalou, 2015) and drives eating behaviour in the moment, while higher-order goals are mental representations, often pursued intentionally, that motivates behaviour and expectations for long-term benefits (see Kotabe & Hofmann, 2015). Self-control has been conceptualised as the ability to override an immediate and automatic response for another reflective response that aligns with long-term goals, values, or normative beliefs of individuals (Hofmann et al., 2012). Kotabe and Hoffman (2015) formulated an integrative model of self-control, highlighting that conflict arises when both desires and goals are co-activated and incompatible.

Conventionally, research highlights that exercising self-control demands effort (Baumeister et al., 1998; Fujita, 2011; Inzlicht & Schmeichel, 2012; Milyavskaya & Inzlicht, 2017). Other views emphasise drawing on automatic and effortless processes which suggest that enacting self-control can be effortless when adopting strategies that bypass people's limited access to resources (de Ridder et al., 2012a), such as actively choosing to avoid or change situations to diminish short-term impulses and strengthen long-term ones. According to dual-process

models, intentional and effortful controlling of behaviours happen when enough self-control resources are available (Baumeister et al., 1994; de Ridder et al., 2012).

Reducers may experience conflict between their long-term goals of reducing the consumption of meat or dairy and their short-term goals of enjoyment when consuming these foods, and may require self-control (Adriaanse et al., 2014; van't Riet et al., 2011; Wood & Neal, 2007). Overall, I propose that both self-control processes and self-control resources may play a key role in enabling the reduction meat and dairy intake and in developing strategies to maintain this behavioural change. In examining the change in habits related to meat and dairy consumption, I overviewed habitual and self-control factors in changing the habits of consuming meat and dairy, as well as some situational factors. Hereafter, I highlight the social component of eating environments, particularly that consumption patterns are influenced by social factors.

1.7 The Role of Stereotypes and Meta-stereotypes in the Transition Towards Consuming Less Meat and/or Dairy.

1.7.1 Social Influences in Meat and Dairy Consumption

Meat and dairy consumption is shaped by early family environments, sociocultural tradition, norms, and socioeconomic status that place high value in the consumption of these foods (Devine et al., 1998; Henchion et al., 2021; Stewart et al., 2021). On an individual level, people's behaviours are moulded within groups that establish what is or is not appropriate, and tend to conform to normative expectations (Asch, 1955; Higgs, 2015). People use others' eating behaviours to guide what and how much to eat, a phenomenon known as social modeling. A review of experimental studies with various methodologies found a significant effect of social modeling on food type choices within social contexts (Cruwys et al., 2015). In the context of meat consumption, people who strongly ascribe to carnist norms resist reducing their personal meat consumption (Macdiarmid et al. 2016), and value eating meat as natural, necessary, and nice (Piazza et al., 2015). People adopt values that influence their food choices, and guide the feelings, strategies, and behaviours they hold in relation to their food choices (Chen & Antonelli, 2020). Moreover, the lack of support from others

hinders the adoption of restrictive diets (Hodson & Earle, 2018), but those who join support groups tend to adhere to vegan/vegetarian diets for longer periods (Haverstock & Forgays, 2012a). This highlights the importance of group settings in dietary behaviours.

People's dietary behaviours often communicate their values, as well as reflecting social identities, social status, or roles (Lindeman & Sirelius, 2001), and dietary choices and behaviours influence how they are seen by others (Higgs & Ruddock, 2020; Steim & Nemeroff, 1995). People attribute traits to others based on their food choices (Steim & Nemeroff, 1995; Vartanian et al., 2007), especially when the diet goes against the mainstream (O'Connor & Monin, 2016). Choosing to avoid meat and dairy in cultures where eating these foods is the norm may be perceived as a threat to normative beliefs, values, attitudes, or moral standards (Lee et al., 2013). As a result, people that choose diets outside of the mainstream norm are categorised as deviants (Herman et al., 2019). Within the COM-B framework, researchers highlighted the limited of evidence in the opportunity domain, which includes the opportunity from one's social environment (Graça et al., 2019). Therefore, the mechanism underlying the challenges that minority dietary groups face within the social dimension must be examined further.

1.7.2 Social Identities and Categorical Representations in the Transition Towards Consuming Less Meat and/or Dairy

The social identity approach provides a theoretical framework for inter- and intra-group dynamics and highlights that individuals are shaped by how they see themselves and others in social groups, and the psychological and social dynamics within those groups (Abrams & Hogg, 1990), which forms the foundation of cultural norms (Morris et al., 2015). This approach merges social categorisation theory (Turner et al., 1987) and social identity theory (Abrams & Hogg, 1990; Haslam, 2014; Hornsey, 2008) rooting in social cognitive and behavioural approaches. Self-categorisation theory highlights how people perceive others and themselves as members of categories or groups (Tajfel et al., 1971), termed in-group for a group they belong to and out-group for groups they do not belong to. Social identity theory illustrates the process whereby

people internalise *social identities* from which people derive part of their self-concept from their in-group membership (Tajfel & Turner, 1986). This includes a process of *social categorisation* (placing others into categorical groups), *social comparison* (evaluating characteristics of the self in relation to others), and *social identification* (positioning the self into the group context). This approach emphasizes the impact of social processes on human behaviour, intergroup conflicts, and the formation of stereotypes and prejudice, highlighting the role of social context and group dynamics in shaping attitudes and behaviour within intergroup relations.

Social categorisation is a natural human phenomenon that has deep evolutionary and cultural roots. The tendency to form groups is part of the nature of humans (Buss, 1995). People classify concepts, things, or other beings in relation to everyday familiar categories. In fact, all social representations aim to "make something unfamiliar, or unfamiliarity itself, familiar" (Moscovici, 1984, p. 24). While classification may serve an adaptive purpose, they form a basis for believing that certain characteristics are associated with groups. By belonging to a group, people may derive a positive sense of self and boost their self-esteem from group membership (e.g., Hogg, 2000; Hogg & Hains, 1998).

Group membership processes may influence group dynamics in many ways. People may perceive outgroup members based on group characteristics rather than on unique qualities (Montrey & Shultz, 2019), and often develop a preference for their ingroup over outgroups (Bagci et al., 2021; Tajfel & Turner, 1986). Even assigning people to arbitrary groups can lead to ingroup favouritism and outgroup discrimination, as demonstrated by the minimum group paradigm (Diehl, 1990). People may also be more critical and adopt the tendency to harshly judge the members of their ingroup who reflect negatively on the group itself to maintain a positive social identity (Khan & Lambert, 1998; Kutlaca et al., 2020).

Social identification can influence people's motivations to adopt and maintain a vegan diet. Socially identifying oneself as a vegan positively predicted adherence to a vegan diet (Cruwys et al., 2020). Additionally, viewing vegans as social deviants may impact motivations to consume a vegan diet. Researchers

have developed a framework to illustrate how vegan identities can trigger feelings of dissonance amongst omnivores, that stems from a conflict between people's moral identity (e.g., being an ethical human) and carnist identity (e.g., the belief that eating meat is necessary), known as the vegan paradox (De Groeve & Rosenfeld, 2022). As a consequence, omnivores may view vegans as committed and moral, or as arrogant and overcommitted. Such views can impact people's willingness to adopt a vegan diet.

Overall, the social identity approach is a suitable framework that can aid in understanding how individuals use food choices to express and reinforce their social identities. By identifying with a specific dietary group, individuals signal their belongingness to shared values, beliefs, and practices related to food (Vestergren & Uysal, 2022). Social identity provides insights around how group perceptions and stereotypes may develop, contributing to the accentuation of in-group positivity and out-group negativity. Adopting an identity-based approach considers the role of intergroup processes within various social contexts (Judge & Wilson, 2019), extending beyond behavioural factors (Hodson & Earle, 2018). Therefore, understanding how people who are reducing or eliminating highly normative foods are affected by these perceptions, directly and indirectly. As Hogg and Vaugham (2002, p.3) stated "*What makes Social Psychology social is that it deals with how people are affected by other people who are physically present... or who are imagined to be present... or even whose presence is implied*".

1.7.3 Stereotypes and Meta-stereotypes of Vegans

Examining stereotypes and meta-stereotypes together provides a more comprehensive understanding of intergroup relations, biases, and societal dynamics than addressing them separately. While social-psychological research on intergroup prejudice and conflict has traditionally centred around attitudes, feelings, and behaviours of one group toward another (Earle & Hodson, 2017; Phelan et al., 2008), other research examined the targets of stereotypes and exploring the experiences connected to being a target of stereotypes, such processes related to meta-stereotyping. *Stereotypes* are belief that certain characteristics are associated with an outgroup and explain how people see and

act towards different groups (Tajfel, 1982). When people experience being targets of stereotypes, those stereotypes are not easily changed (Tajfel, 1982). People may also form ideas of how others perceive them. *Meta-stereotype*, a term coined by Vorauer relating to one's beliefs about the stereotypes that out-group members hold about their in-group (Vorauer et al., 1998), may be triggered by a process of thinking of how one is perceived or by actual interactions with outgroups that strongly stereotype their ingroup. Relying on stereotypes and meta-stereotypes potentially leads to oversimplified and biased views of groups (Judd et al., 2005; Montrey & Shultz, 2019).

There is ample research evidencing vegan mainstream stereotypes (Branković & Budžak, 2021; De Groeve & Rosenfeld, 2022; Giacoman et al., 2021; Minson & Monin, 2012; Modlinska et al., 2020). As most minority groups, vegans have been stigmatised (see Vestergren & Uysal, 2022). Recent research highlights people's perception of vegans as being mixed, such as the belief that vegans are arrogant and overcommitted yet moral (De Groeve et al., 2021). Others conducted studies aiming to assess whether bias exists toward vegetarians and vegans (MacInnis & Hodson, 2017), and found that omnivores evaluated vegans more negatively than they did other groups facing prejudice (e.g., Blacks), and other dietary groups (e.g., gluten intolerant). Researchers also found that omnivores evaluated vegans more negatively when vegans held ethical motives (e.g., environmental or animal ethics), with biases being stronger among those who held right-wing ideologies (MacInnis & Hodson, 2017). Moreover, after recruiting non-vegetarians from New Zealand, researchers asked participants questions about their beliefs and views on society, and later randomly assigned participants to express their opinions about either vegetarians or vegans (MacInnis & Hodson, 2021). Although attitudes were generally positive, non-vegetarians had fewer positive attitudes toward vegans compared to vegetarians, and men showed fewer positive attitudes toward both groups compared to women. This aligns with other research suggesting that perceptions of vegans differ by gender (Modlinska et al., 2020).

While perceptions of vegans have been thoroughly explored, some researchers examined perceptions and attitudes vegans hold about omnivores. For example, attitudes of vegans toward omnivores were found to be significantly more

negative compared to the attitudes of meat eaters toward vegans (Pabian et al., 2023). Attitudes and perceptions about omnivores may develop from actual interactions with omnivores, or solely by vegan's awareness of how omnivores perceive them. Researchers found that beliefs about how an outgroup view their ingroup (meta-stereotype) are more negative than beliefs they hold of their ingroup (self-stereotype) (Vorauer et al., 1998). This idea was broadened to include what individuals from another group believe about their ingroup during actual interactions (Vorauer et al., 1998). When the majority group expected to be stereotyped negatively by the minority group, enjoyment of intergroup contact decreased. Such processes resulted in exhibiting more prejudice and feeling a stronger self-concept (Vorauer et al., 1998). The process of thinking of how one is perceived has been suggested to be greatly impacting intergroup interactions, more so than the stereotypes they personally hold about the other group (Vorauer et al., 1998).

Vegan meta-stereotypes, or the beliefs that vegans hold about how omnivores perceive vegans, have not been previously explored, despite evidence pointing towards meta-stereotyping. Thinking about one's self-image has the potential to trigger concern or fear of being judged (Vorauer et al., 2009). Holding meta-stereotypes can lead to avoidance of intergroup interactions increased intergroup bias (Paolini et al., 2006). Indeed, vegans sometimes avoid disclosing their dietary choices out of concerns around navigating difficult conversations with omnivores about their dietary choices and motives (Buttny & Kinefuchi, 2020), partly due to fears of being stereotyped or worries of being judged (Edwards, 2013). Reducers may experience similar fears and worries (Rosenfeld & Tomiyama, 2019). Therefore, I will examine vegan meta-stereotypes, in other words, what people, specifically reducers and vegans, perceive omnivores think of vegans.

This research presents a novel outlook to meta-stereotype research. Research has predominantly examined meta-stereotype processes within individuals belonging to polarised and inherent groups that they strongly identify with, and have examined the behavioural implications, such as avoidance and help-seeking behaviours. No research to our knowledge has examined meta-stereotype processes within acquired polarised groups, specially within groups with low

ingroup identification, i.e. that do not necessarily strongly identify with their ingroups. Additionally, no research has examined the role of meta-stereotypes in eating behaviours and motivations. Vegans may encounter both positive and negative stereotypes related to their dietary and lifestyle choices, and they are likely aware of these mainstream perceptions. Similarly, individuals reducing their meat and/or dairy consumption may also be cognizant of the stereotypes associated with vegans. Whether and how meta-stereotype processes influence vegans and reducers' motivations to maintain dietary changes is of interest here.

In this section, I aimed to explore the barriers to reducing meat and/or dairy intake, and, more specifically, the role of stereotypes and meta-stereotypes of vegans not only among the stereotyped ingroup (i.e., vegans), but also among an "adjacent" group (i.e., reducers). While this may not precisely align with the definition of meta-stereotypes – which pertain to perceived stereotypes about one's ingroup – I will use the term "meta-stereotypes" for simplicity and consistency across our studies. Meta-stereotype falls within the classification of group meta-perception. However, their implications on behaviour and identity could differ, given that meta-stereotypes involve targeted stereotypes towards one's own group, as later discussed in my discussion.

1.8 The Current Thesis Structure:

The primary objective of this thesis is to offer insights into the social and psychological mechanisms that play a role in reducing meat and/or dairy intake, and therefore, the transition to more a reduced meat and/or dairy diet. This research illustrates experiences of reducers in their dietary transition from a self-control perspective, as well vegans' and reducers' perceptions of mainstream views of vegans and vegan diets, and how might these influence them.

In Chapter 2, I will present my work on the experiences of meat and/or dairy reducers holding primarily environmental motives in their dietary transition from a self-control perspective. This chapter addresses the gap in the literature highlighted by Graça et al. (2019) in their systematic review on barriers and enablers of meat consumption. I focused on reducers with predominant

environmental motives, as these were much less examined than animal ethics and health (Bastian & Loughnan, 2017; Docherty & Jasper, 2023; Hopwood et al., 2020). Specifically, I explored the role of habits, identity, and social norms in this dietary transition, using a qualitative approach. By understanding the role of these components, I examined the individual's need for self-control, within the context of their sense of identity and cultural norms, in order to deepen our understanding of how people adopt and maintain the behaviour changes. I also examined my positionality as a researcher and how my personal journey of reducing meat and dairy lead to the formulation of the next chapters.

Chapter 3 builds on the previous findings, in which participants reported expecting or worrying being judged when they chose to avoid meat or dairy-based foods. I examined meta-stereotypes of vegans across two studies with two samples, vegans and meat and/or dairy reducers. There is a lack of research examining why and how social processes facilitate a sustained vegan diet and identities. In Study 1, I examined whether vegans hold stereotypes and meta-stereotypes about their in-group, and whether meta-stereotypes are linked to vegan identities and outgroup regard. In Study 2 using similar methods, I examined whether reducers hold stereotypes and meta-stereotypes about vegans, and whether meta-stereotypes are linked to their motivation to maintain their dietary changes. The motivational component I examined is the motivation to maintain a dietary change. For vegans, this relates to maintaining a vegan diet. For reducers, different individuals might be reducing different degrees of their meat and/or dairy intake and can be at different stages of their reduction journey, with different dietary reduction goals (e.g., meat-free Monday vs eating meat once a month). Therefore, it is more appropriate to assess maintenance of dietary changes. These were examined within various social and non-social context.

Chapter 4 presents qualitative findings from the study on reducers above, focusing on reducers' responses to open-ended questions. Here, I explored perceptions of barriers around reducing meat and/or dairy intake, as well as perceptions they and others hold about vegans, and how these influences their reduction process. I highlighted how my experiences of pressure from family, combined with experiences of participants' expectation of being judged in

certain contexts, led to the formulation of Chapter 4. Findings from the qualitative analysis were displayed separately to fully illustrate the qualitative findings and give them full value.

Chapter 5 presents the general discussion, integrating the findings from Chapters 2-4, as well as theoretical and practical implications on my findings. I addressed the role of habits and social norms from a self-control perspective, as well as the potential role of stereotypes and meta-stereotypes in social identities in the context of dietary behaviours. I also highlight implications for identity and behavioural change theories, as well as propose a novel research outlook on meta-stereotypes for future research. For instance, exploring differences in meta-stereotype processes among individuals from polarised groups can reveal distinctions between those from groups with inherent characteristics versus acquired ones. I also highlight practical implications for sustainability research, suggesting the need for a complex approach, both on an individual-level and system-level.

Chapters 2 - 4 were written as separate journal articles, and content from these chapters may be overlap. Chapter 2 "*It's easy to maintain when the changes are small: Exploring environmentally motivated dietary changes from a self-control perspective*" was published in *Collabra Psychology* (see Wehbe et al., 2022). Chapter 3 "*Meta-stereotypes and their associations with eating motivation and identity among vegans and meat and/or dairy reducers*" (Wehbe et al., 2023a) is available as pre-prints. Chapter 4 "*To stand out or to conform: Stereotypes and meta-stereotypes as barriers in the transition to sustainable diets*" (Wehbe et al., 2023b) is available as a preprint and now under review. My intention is to submit Chapter 3 to an appropriate international journal after March 2024.

In sum, each of the empirical studies presented here addresses an aspect of my overarching aim: understanding experiences and perceptions related to reducing the consumption of meat and/or dairy. By examining the various aspects of the behavioural change at hand, the empirical work collectively enhances our theoretical framework and provides valuable insights. These insights inform and support change at an individual level, as well as contributes to broader systems

aiming at fostering a more ethical, sustainable, and health-focused food landscape.

2 Chapter 2: It's Easy to Maintain When the Changes are Small: Exploring Environmentally Motivated Dietary Changes from a Self-Control Perspective.

This chapter is a copy of the following published manuscript:

Wehbe, L. H., Banas, K., & Papies, E. K. (2022). It's Easy to Maintain When the Changes Are Small: Exploring Environmentally Motivated Dietary Changes from a Self-control Perspective. Collabra: Psychology, 8(1). https://doi.org/10.1525/collabra.38823

2.1 Abstract

Reducing meat and dairy intake is necessary to mitigate the effects of animal agriculture on global warming. Here, we examine the experiences of environmentally motivated meat and dairy reducers. Specifically, we examine whether shifting towards and maintaining sustainable eating behaviours requires self-control. We conducted a pre-registered qualitative online study surveying 80 participants to explore their experiences of reduction, particularly the role of self-control, habits, identity, and social norms. We analysed the data using reflexive thematic analysis and generated three themes. Theme 1 captures participants' incompatible short-term and long-term motivations, which led to experiences of conflict and required self-control to manage. Theme 2 describes aspects of food and social environments, such as social feedback and food availability, cost, and appeal, that hindered or supported participants' attempts at reducing meat and dairy intake. This theme also revealed that most reducers did not want to identify with specific dietary groups, particularly flexitarians. Theme 3 captures strategies, varying in effort, that helped participants overcome internal conflicts or challenges from the food and social environment. Examples include avoiding choice situations, or behavioural substitution, which facilitated behaviour maintenance through small and comfortable changes that fit with participants' taste, skills, and habits. Our findings highlight the need to temper negative social feedback and introduce more availability and favourable social norms to support meat and dairy reduction. Interventions that aim to support the transition to sustainable eating also need to consider the social identities of consumers.

Keywords: flexitarian, self-control, identity, habit, social norms, qualitative research.

2.2 Introduction

Current levels of meat and dairy consumption in Western societies are unsustainable and need to be rapidly reduced to curb climate change (Clark et al., 2020; Committee on Climate Change, 2018; Intergovernmental Panel on Climate Change [IPCC], 2019). Modern meat and dairy farming not only contributes to greenhouse gas emissions and environmental degradation (Federici et al., 2015; Vermeulen et al., 2012; Willett et al., 2019) but also raises ethical concerns (Cornish et al., 2016). Further, the excessive consumption of these foods can negatively impact human health (Hansen et al., 2018). Consumers are increasingly aware of the environmental impacts, and many are open to adapting their diets (Sanchez-Sabate & Sabaté, 2019).

Research has generated a large body of literature on vegans and vegetarians (Hoffman et al., 2013; Judge & Wilson, 2019; Rosenfeld & Burrow, 2017), but meat and dairy reducers remain an underexplored group (Graça et al., 2019; Taufik et al., 2019). Especially dairy reduction is under-researched (Sandberg, 2021). While vegan diets may be the most sustainable, it is unlikely that most Western populations would adopt them. Therefore, encouraging smaller-scale reductions among mainstream consumers may be more realistic (Graça, Oliveira, et al., 2015). Consequently, it is important to understand the daily-life experiences of consumers reducing meat and dairy consumption, in order to understand what could be done to best support their efforts. This paper aims to explore the experiences of meat and dairy reducers who are driven by environmental motives.

2.2.1 Meat and Dairy Reducers: What is Known About the Process of Reduction?

We define meat and dairy reducers as individuals who are actively trying to reduce their meat and dairy intake, even though we acknowledge that they may not always be successful. Meat and dairy reducers may vary widely in their consumption frequencies of certain foods and their dietary identification (Malek & Umberger, 2021). The reduction process often follows a specific order based on food status hierarchy (Grassian, 2020), potentially based on perceived human-animal similarities (Rothgerber, 2014). Reducers often begin avoiding red

meat first, followed by white meat, dairy, eggs, then seafood. However, there is variability in this pattern (Calton et al., 2014). Additionally, there is variability in dietary group identification: meat and dairy reducers may identify as omnivores or as flexitarians, vegetarians, or semi-vegans. At face value, these dietary groups may seem categorically different in how frequently people consume animal foods, but consumers understand and identify with these groups in variable ways. For example, individuals who eat fish, yet do not consider fish as meat, may identify themselves as vegetarians (Rosenfeld & Tomiyama, 2021a), and flexitarians who do not consume meat may not identify with vegetarians to avoid stigmatisation (Rosenfeld, Rothgerber, & Tomiyama, 2020). We will explore this issue in the current study to better understand the role that such identity processes may play for meat and dairy reducers.

Meat and dairy reducers may reduce consumption of these foods for various reasons, which might translate to different processes and outcomes. Numerous researchers have explored the primary motives that meat and dairy reducers hold, such as health, animal welfare, and the environment (De Backer & Hudders, 2014; Hielkema & Lund, 2021; Lacroix & Gifford, 2019; Rothgerber, 2015; Grassian, 2020). While one systematic review suggested that individuals reducing meat intake for ecological reasons are a minority (Sanchez-Sabate & Sabaté, 2019), another more recent review highlights that both sustainability and health are currently important motives for reducing meat and dairy consumption (see Dagevos, 2021). Given the climate emergency, we predict that in the future, the group of consumers trying to reduce their meat and dairy consumption for environmental reasons will increase (Bastian & Loughnan, 2017; Mathur et al., 2020). Therefore, the current article focuses on exploring the experiences of environmentally motivated meat and/or dairy reducers.

The literature on shifting from meat-based to plant-based diets is rapidly growing (Graça et al., 2019; Stoll-Kleemann & Schmidt, 2017; Taufik et al., 2019), and has identified a broad array of barriers and enablers to reducing meat consumption. Meat disgust (Rothgerber, 2014a), awareness of climate impacts (Kirsten et al., 2020), as well as supportiveness from others (Haverstock & Forgays, 2012; Hielkema & Lund, 2021), are some of the factors that enable consumers to reduce their meat and dairy consumption. In contrast, meat

attachment, hedonic enjoyment of meat (Graça, Calheiros, et al., 2015), and the belief that consuming meat is natural, normal, necessary, and nice (Piazza et al., 2015) can be barriers to reducing the consumption of meat. Meat reducers also need to confront norms and attitudes that favour meat-eating (Grassian, 2020), especially for men, and may struggle to overcome their own meat consumption habits (Hoek et al., 2017). Barriers may also include the lack of information and cooking skills, social prejudices and lack of support, as well as moral disengagement, liking of meat, and frequent meat-eating (Graça et al., 2019). Meat reducers may further face barriers such as food neophobia and identity-incongruence (Hielkema & Lund, 2021). For young adults, their sense of control over their food choices, cravings, conflicting eating motives, and compromises at social gatherings may be additional barriers (Kemper & White, 2021).

Similarly, environmental factors such as visibility, proximity, and availability of foods, can strongly shape choices. A review of 15 articles on nudging consumers' food choices shows the promising effect of making changes to the food environment on choice without depriving consumers of choices (Bucher et al., 2016). Other research showed similar effects of nudging on increasing fruit and vegetable intake (Broers et al., 2017) and healthier diets and nutritional choices (Arno & Thomas, 2016).

Thus, there are many barriers and facilitators to reducing meat and dairy intake, and meat and dairy reducers need to navigate often challenging food environments with varying availability of sustainable food choices. This suggests that self-control might play an important role in maintaining reduction behaviour. To our knowledge, no research has attempted to explore the experiences of environmentally motivated meat and dairy reducers from a self-control perspective. Therefore, that is the focus of the current article.

2.2.2 Possible Self-Control Challenges of Reducing Meat and Dairy Intake

Meat and dairy reducers often need to overcome pre-existing meat-eating and dairy-eating habits, temptations to consume meat and dairy, or social norms promoting the consumption of meat (Zur & Klöckner, 2014). Encountering such

barriers may lead to the need for self-control. While the evidence on barriers to reduction is increasing in the literature, little is known about the psychological experiences of meat and dairy reducers and the social and environmental factors influencing them (Graça et al., 2019). In this paper, we address these gaps by exploring whether reducing meat and/or dairy requires self-control, the situations that necessitate the exertion of self-control, and how individuals manage these challenges.

Self-control has been defined as "the ability to restrain impulses in the service of greater goals and priorities" (Milyavskaya & Inzlicht, 2017, p. 1). While this has often been understood as requiring effort, it has also been suggested that self-control can be effortless, for example when adaptive habits are developed and automatically inhibit desires (Adriaanse et al., 2014). The relationship between self-control and behaviour change maintenance has been previously examined mainly in health domains. For instance, self-control predicted adherence to weight-loss programs (Baker & Kirschenbaum, 1993; VanEpps et al., 2016). In the domain of meat reduction, one study found no effects of self-control on adherence to vegan, vegetarian, and health-related diets (Cruwys et al., 2020). Others suggested that reducers who identified as omnivores more strongly reported a need for self-control than vegetarians (Allen et al., 2000), perhaps because vegetarians rely more on their social identity and motivation to adhere to their diets rather than their psychological capacities. To the best of our knowledge, there has been no research with the primary aim of exploring the role of self-control in the process of reducing meat and dairy intake, and we aim to fill this gap in the literature.

Meat and dairy reducers may experience conflict between their long-term reduction goals, and their habits and desires to consume these foods. Like most eating behaviour, the consumption of meat and dairy is influenced by habits and liking, as most people have frequently consumed these foods from an early age (Papies, Johannes, et al., 2020; van't Riet et al., 2011). Inhibiting habits and food temptations typically requires self-control (Adriaanse et al., 2014; van't Riet et al., 2011; Wood & Neal, 2007), as also suggested by dual-process theories (Hofmann et al., 2008). Indeed, self-control processes are often activated when conflict between desires and higher-order goals is detected (Inzlicht &

Schmeichel, 2012; Kotabe & Hofmann, 2015). Some of these processes may be deliberate and effortful, but dual-process models of behavioural regulation suggest that effortful processes are more likely to guide behaviour when sufficient self-control resources are available (R. F. Baumeister et al., 1994; de Ridder et al., 2012b). Thus, both self-control processes and self-control resources may play a key role in enabling the reduction meat and dairy intake and in developing strategies to maintain this behavioural change.

The mechanisms of behavioural maintenance that have been identified for successful health behaviour change may also play a role in reducing meat and dairy intake for environmental reasons. Health behaviour maintenance models suggest that self-control is essential for dealing with sources of tension, or struggles of maintenance (Greaves et al., 2017; Kwasnicka et al., 2016). Tension may arise from external influences (e.g., social pressure) and individual capacities (e.g., motivation). In the context of our research, we propose that managing tension, such as inhibiting desires and old habits, may be required to transition to and maintain the reduction of meat and dairy.

Another self-control challenge that may influence the reduction process is the management of conflicting social norms. Social norms and the social environment influence eating behaviour, such that people are motivated to eat the foods that are normative in their society or the social groups they identify with (Demarque et al., 2015; Higgs, 2015). Consuming meat and dairy is the norm for most Western societies (Willett et al., 2019), and deviating from this norm may challenges to one's social identity. Vegans and vegetarians have often managed this challenge by developing a strong sense of identification with their dietary group, a key factor in the maintenance of their diet (Cruwys et al., 2020). On the other hand, flexitarians view their diet as less central to their identity, which might make their transition more challenging (Rosenfeld, Rothgerber, & Tomiyama, 2020). Meat and dairy reducers may not necessarily strongly identify with any dietary group. Little is known about meat and dairy reducers' social identities and how they shape their experiences and behaviours. The current research addresses this gap.

2.2.3 The Current Study

Understanding what facilitates and hinders meat and dairy reduction is important, because it could inform ways to better support individuals transitioning to reduced meat and dairy diets (Graça et al., 2019). Here, we explored the experiences of individuals in this transition, to ultimately identify ways to better support them toward more sustainable diets. We conducted qualitative research to address the following research questions:

1) How do people perceive and experience the transition towards more sustainable eating behaviours?

2) Does shifting towards and maintaining sustainable eating behaviours require self-control? If so, what are the situations where people feel they need to exert self-control? And how do they deal with these challenges?

3) What are the roles of habits, identities, and social norms in the transition towards and in the maintenance of sustainable eating behaviours? And how do people experience them?

2.3 Methods

We developed an online qualitative survey for our comparative case study design (Braun et al., 2020). A key advantage of online survey methods is that it allows for potentially rich data from a broad representation of individuals and experiences (Braun et al., 2020). We asked participants questions related to their current diet and their reduction goals and experiences. All study materials, including the full survey schedule and data, are available on the Open Science Framework (OSF; https://osf.io/vuhsy/).

2.3.1 Procedure

We held question creation meetings using the research aims, research questions, and relevant theories on behavioural change and self-control (Greaves et al., 2017; Kotabe & Hofmann, 2015; Kwasnicka et al., 2016). We ensured an open-ended format (Korstjens & Moser, 2018) and piloted the survey for

comprehension (n = 5). The resulting survey included 14 open-ended questions covering various aspects of the reduction experience (see Table 1).

Then, to yield a deeper understanding of participants' experiences, we asked four background questions on current meat and dairy intake (e.g., "In a typical week, how often do you eat meat?", "In a typical week, how many times would you like to eat dairy?"), on current diet ("Which of these describes you best at the moment?" response options: "I am currently trying to reduce meat, not dairy", "I am currently trying to reduce dairy, not meat", "I am currently trying to reduce both meat and dairy"), and on the desired future intake of these foods ("In a typical week, how many times would you like to eat meat?", "In a typical week, how many times would you like to eat dairy?"). Finally, we asked demographic questions, such as age, gender, occupation, education, perceived social class, and nationality.

Table 1 - Main questions of the survey schedule as shown to participants

1) Tell us about your experience in changing your eating behaviour. How is the reduction of meat and/or dairy going for you?
2) Can you tell us about when you started to reduce meat/dairy? Was it a specific event that triggered this change? Why did you decide to change?
3) Tell us about the changes in your eating habits while you are trying to reduce meat and/or dairy. Which new habits have you been able to maintain and which not? Please describe.
4) Can you tell us about some of the challenges you experience when trying to reduce your meat and/or dairy consumption?
5) Have you ever felt conflicted, for example, because you felt like eating meat and/or dairy? How did you respond? What happened?
6) Can you tell us about the effort that this change in eating behaviour is taking? Why is it more difficult at some times than at others? Can you give us an example of when it is easy and an example of when it is difficult to reduce meat and/or dairy? Please explain.
7) How confident do you feel in your ability to change your eating habits?

8) Tell us what helps you maintain your new eating habits of reducing meat and/or dairy. What are effective ways that help you reduce meat and/or dairy? Give us an example and describe.

9) Can you tell us about an experience of going back into your old behaviour of consuming higher quantities of meat and/or dairy (if any)? Why did this occur? How did you respond?

10) What do other people in your life think of you reducing meat and/or dairy? How do they react? Can you give an example? Do other people's responses affect you in any way? Do they help or hinder you?

11) How do you think your decision of reducing meat and/or dairy impacts others in your direct environment?

12) Do you currently see yourself as a person who eats meat, a flexitarian, a vegetarian, or a vegan? What do you think about these groups? Please explain.

13) What would make it easier for you to reduce your meat and/or dairy intake? Is there anything that you, people, or organisations in your daily life environment could do to help you?

14) How do you feel in general about your transition to reducing meat and/or dairy?

Question 13 asks for participants' suggestions about what they, or others, could do to make their dietary transition easier and more enjoyable. The responses to this question were gathered into one subtheme (3.3.3) where we included counts of participants mentioning each contextual strategy. Although generating meaning from the data partly depends on more comprehensive patterns (Sandelowski, 2001), we believe that displaying the counts for this subtheme will provide a comprehensive overview for the reader of what lay people think could help them in their reduction process.

The study received ethical approval from the University of Glasgow Research Ethics Committee. To enhance transparency, we pre-registered the study and documented the complete research process (see OSF; https://osf.io/bhvyw). Pre-registration can help ensure that the a-priori decisions to observing the data

are maintained and encourage new intentional decisions in case of changes (see Kern & Gleditsch, 2017; Haven & Van Grootel, 2019).

2.3.2 Participants

Participants were recruited through the online research platform Prolific (prolific.co). Inclusion criteria were: living in the UK, between 18 to 65 years of age, and being fluent in English. One thousand participants answered three screening questions (average duration 1 min; payment £0.1); “Are you currently trying to reduce your meat and/or dairy intake?”, “What is the most important motive for you to reduce meat and/or dairy right now?”, and “Which of the following dietary categories do you see yourself belonging to?”. We selected participants who were trying to reduce meat and/or dairy and indicated that their most important motive was environmental. In the rest of this article, we refer to these participants interchangeably as meat and dairy reducers or meat and/or dairy reducers. We excluded vegans and self-identified omnivores who did not want to reduce meat intake (n = 192). Then, 239 participants who satisfied the inclusion criteria (female: 192/ male: 42/ other: 5) were invited to the main survey. Participants completed the survey on Qualtrics (average duration 30 min; payment £3.75). In line with research on reducers (Dagevos, 2021), most participants were female.

We stopped data collection once 80 participants had completed the main survey. This predetermined sample size was based on recommendations for sample size with online qualitative surveys (Braun et al., 2017, 2020; Malterud et al., 2016) and our budget limits (see OSF). We also used the definition of data saturation as "the point where no new and meaningful information is being generated" (O’Reilly & Parker, 2013). Saturation of new information started at the 65th case. However, we were more interested in the quality of the generated data described as data 'sufficiency' or 'quality' (Braun & Clarke, 2019). All authors discussed data saturation and quality thoroughly in weekly analysis meetings.

2.3.2.1 Sample Description

A summary of demographic information about our sample is presented in Table 2. Detailed demographics can be found in the Supplemental Materials on the OSF.

Self-identified omnivores in our sample reported consuming meat meals moderately often (range: 4 – 10 meat meals per week) and dairy more frequently (range: 5 – 21 dairy-containing meals per week). Self-identified flexitarians reported consuming meat and dairy less frequently (1-10 and 0-14 meals with meat/dairy, resp.). Some self-reported vegetarians reported eating meat (including fish) once or twice a week and dairy between 0 to 14 meals per week, while others described themselves as "strict vegetarians" and reported eating no meat and eating dairy at most a few times a week.

Table 2 - Frequency table summarising participants' demographics and dietary background (N = 80)

Demographics	*Participants*
1. Gender	
Female (F)	63
Male (M)	15
Non-Binary (NB)	2
2. Age Range	
[18 - 25]	19
[26 - 35]	21
[36 - 45]	17
[46 - 55]	17
[56 - 65]	6
3. Education Status	
Secondary	7
College	20
Undergraduate	37
Graduate	14
Doctoral	2
4. Current Diet	
Reducing both meat and dairy	48
Reducing meat only	28
Reducing dairy only	4
5. Meat Goals	
No reduction	8
Less than 50% reduction	20
50% reduction	9

More than 50% reduction	15
Full reduction	20
Increase	8
6. Dairy Goals	
No reduction	18
Less than 50% reduction	21
50% reduction	8
More than 50% reduction	11
Full reduction	14
Increase	8

Note. All demographic and background questions were asked in open format, except for the educational qualification question. Meat and dairy goals were determined using percentages comparing participants' approximal current intake (e.g., "how often do you eat meat") and their approximal desired consumption in the near future (e.g., "how many times would you like to eat meat"). 'Increase' represents that a participant reported a higher number for desired future consumption than for current consumption.

2.3.3 Data Analysis

In our analysis, we developed thematically organised patterns throughout the dataset, supported by quotes. We adopted a reflexive thematic analysis (Braun & Clarke, 2006, 2013, 2014, 2019) and followed the six stages of reflexive thematic analysis using NVivo Software (Windows Version 12) as a qualitative analysis management tool (Castleberry & Nolen, 2018; Maher et al., 2018; Silver & Lewins, 2014). We used a hybrid approach of inductive and deductive coding (Fereday & Muir-Cochrane, 2006), generating broad data-driven conclusions and using pre-existing theories to guide our observations with an a-priori list of codes (see OSF). In other words, we explored and analysed the data separately from the relevant theories highlighted in the above section, and later, we discussed how the data links to the theories. The generated codes followed the process described in Table 3.

Since the flexible theoretical framework of this method can lack a grounding orientation (Braun & Clarke, 2013), we adopted critical realism as a methodological framework compatible with thematic analysis (Braun & Clarke, 2019; Fletcher, 2017). Critical realism's approach consists of causal or generative mechanisms (Bhaskar, 2013; Sayer, 2010). It begins with identifying

the social problem and infers backwards to conceptualise from empirical data about the phenomenon whilst drawing on understandings from previously established knowledge in a different context. This perspective aligns with our aim to understand the subjective meaning and experiences and identify the mechanisms that underpin the maintenance of reducing meat and dairy for environmental reasons.

Table 3 - Thematic analysis process

Thematic analysis process based on the six phases outlined by Braun and Clarke (2006, 2013, 2019).

Phases	Process	Author involvement
Phase 1: Data familiarisation	The process of familiarisation encompasses the researcher to immerse in the data by reading and rereading the dataset while taking notes of initial thoughts and insights.	LW engaged with recurrent reading of the dataset to increase familiarity with the data. Apart from reading the dataset as a whole, LW also read the individual cases in context with the background and demographic information prior to coding.
Phase 2: Initial code generation	The process of coding the data involves creating and assigning codes to categorise the data extracts.	Initial exploratory annotations were made, which included descriptive comments of the data. LW coded responses and focused on commonalities and differences based on the frequency, representativeness, and meaningfulness. Codes and extracts were fed back to KB and EP periodically, generating in depth descriptions through discussions.
Phase 3: Initial themes generation	The process of generating initial themes involves clustering together codes	Throughout the discussion process, LW generated initial themes and fed them back to KB

	that are related within and across the individual cases.	and EP. The authors considered deviant cases in their discussions and brought in the different perspective that allows for an unbiased immersion in participants' experience and lens of the analysis.
Phase 4: Reviewing and refining themes	The process of reviewing and refining themes entails verifying whether the themes are an accurate representation of the data.	LW examined the themes across the entire dataset and the coded data. All authors approved the three generated themes to best fit the dataset.
Phase 5: Defining and naming themes	The process of defining and naming themes involves the development of a theme name that formulates the essence of the theme as well as a clear definition of the themes.	LW finalised the definition of all themes and fed those back to KB and EP.
Phase 6: Producing report	Writing the report represents the final stage of the analysis. The write up of the findings and each theme in turn present an opportunity for a final refinement of the themes.	LW developed the written report. All authors reviewed the report and contributed to the write-up and to linking the findings to previous literature and theories

We conducted an additional exploratory analysis to explore how our 80 participants reported their dietary group membership in the pre-screening study versus the main study. In the pre-screening study, participants responded by choosing one of the following categories: '*omnivore*', '*flexitarian*', '*vegetarian*',

‘*vegan*’, or ‘*other*’. We compared these responses to participants’ answers to the open-ended question in the main survey ‘*Do you currently see yourself as a person who eats meat, a flexitarian, a vegetarian, or a vegan? What do you think about these groups? Please explain*’.

2.3.4 Credibility Strategies

Credibility was ensured through persistent observation of the data (Korstjens & Moser, 2018). Detailed descriptions of the participants’ experiences and demographic context enhance transferability, making connections to help provide a comprehensive understanding of the participants’ setting. While there are no set rules as to how many quotes should be used and from how many participants, the focus is on detecting themes that are reflected across the data (Eldh et al., 2020; Sandelowski, 1994). We held meetings periodically during the analysis phase to bring in different perspectives and build consensus. We also discussed and integrated the deviant cases from the patterns that emerged from the data analysis, to support a reflexive approach to research (see OSF). And finally, as the authors’ positionality is pivotal in qualitative research, we declare that LW and EP do not consume meat and are currently trying to reduce dairy intake, while KB seldomly consumes meat and dairy and identifies as a flexitarian. LW kept a reflexive diary (Langdridge, 2007) throughout the data analysis process. Below is an extract from the reflexive diary regarding on LW’s positionality within this research, which influenced the formulation of the current work. For the full report, see OSF.

“Before charting the course of Chapter 2, my journey of reducing meat and dairy consumption began during the pandemic, sparked by a distressing leaked video from a slaughterhouse. This led to a two-year transition to a vegan diet driven by my growing awareness of the environmental impact of animal agriculture. Throughout this shift, I encountered various challenges, including health complications (e.g., irritable bowel syndrome and celiac disease) that added to the struggle or reducing meat and dairy intake. Additionally, missing my mother and grandmother’s Lebanese home cooked meals prompted occasional indulgence in meat- and dairy- dishes during family visits back in Lebanon. Despite these challenges, my journey fuelled my determination to explore the drivers and enablers of sustained dietary changes, aiming for positive impact

beyond personal experiences. This experience, combined with the gap identified in the literature, helped formulate the aims of chapter 2."

2.4 Findings

Participants' responses varied across questions and ranged between 14 to 236 words per response, with an average of 73 words per response and no missing data across responses. We generated three themes from the data (see Table 4). The full supporting quotes for all themes can be found in the NVivo file uploaded on the OSF. Typographical errors were corrected to safeguard the flow of the quotes while conserving the meaning (see OSF). In each subtheme, tables include extracts from participants' experiences alongside a higher-order descriptive pattern that, together, provide a comprehensive overview of the theme at hand. Following each quote, we provide participants' self-reported gender to add depth to the illustrative purpose of our chosen quotes. Specific symbols in participants' extract include: […] indicating where text has been removed to avoid redundancy and [Text] indicating where text has been replaced for clarifications and descriptions.

Table 4 – Table of Themes and Sub-themes

Themes	*Subthemes*
1. Conflicting motivations	1.1. Initial motives and triggers for behavioural change and goal setting
	1.2. Liking and desires for meat and dairy
	1.3. Experiences of conflict resulting from incompatible motivations
2. Barriers, and sometimes support, from the social environment and food environment	2.1. Barriers from the food environment
	2.2. Barriers and support from the social environment
3. Strategies for managing conflict and efforts	3.1. Resolving internal conflicts
	3.2. Resolving conflict from food and social environment
	3.3. Wishful suggestions: what I and others can do

2.4.1 Conflicting Motivations

2.4.1.1 Initial Motives and Triggers for Behavioural Change and Goal Setting

Participants expressed many motives and triggers that prompted their intention to reduce meat and/or dairy consumption. Environmental motives together with other motives such as financial or health concerns, or animal ethics made participants want to limit their consumption of these foods (e.g., P40, M). Most participants described that their decision to change emerged gradually due to a cumulative awareness of the negative impacts of the meat and dairy industry on the environment. For instance, they continuously and increasingly sought knowledge from the media or the news (e.g., P20, F). Some changes occurred due to their worry and anticipation of future events (e.g., P50, F).

A few participants reported being triggered by turning point events, specific occurrences such as the Australian wildfires or watching slaughterhouse footage (e.g., P68, M), watching documentaries made by activists (e.g., P71, F), and their limited spending capacity due to the COVID-19 lockdown (e.g., P79, F). Nonetheless, environmental impacts and animal welfare provoked awareness of conflicting attitudes, beliefs, and behaviours that many participants held at the time of change initiation. As a result, participants' intentions (e.g., P50, F; P71, F; P21, F) and actions (e.g., P68, M) to reduce were primed by the discomfort they experienced. Most participants who did not want to eliminate meat entirely also strongly identified with meat consumers and viewed meat as central to their identity (e.g., P8, M). For supporting quotes, see Table 5.

Table 5 - Data extracts for Sub-theme 1.1.

Initial motives and triggers for behavioural change and goal setting.	
Many different motives	"I have also found myself supporting other arguments (e.g., it's cheaper, moral, health etc...) rather than just the environmental angle." (P40, M)
Gradual change through increasing awareness	"Not a specific event - cumulative reading of lots of articles and to why we should reduce meat and dairy." (P20, F)

Gradual change through worry about the future	“I got increasingly concern about our human impact on the environment, including our consumption of meat […], and meat free Monday is at least a start.” (P50, F)
Specific event of watching disturbing animal cruelty videos	“I started reducing after I saw one of those leaked videos of a slaughterhouse online.” (P68, M)
Specific event of watching documentaries	“I heard a speech by Greta Thunberg about how our consumption of meat is affecting climate change and wanted to take some action.” (P71, F)
Specific event – Covid-19	“It’s about 4 months precipitated by concerned about the environment and trying to reduce spending due to a reduction in income due to Covid.” (P79, F)
Guilt and cognitive dissonance	“I have always been passionate about the environment and have been working around animals for years, so I've always held guilt with me about eating meat, hence why I am trying to reduce it now.” (P21, F)
Dietary identification	“I'd consider myself somewhere in between a meat-eater and a flexitarian. I don't think I'd ever be able to not consume meat; I'd honestly consider it a part of who I am.” (P8, M)

In summary, the data depicts various trajectories to changing behaviour. Sometimes, change was sudden, while other times, it gradually emerged through actively seeking information and increasing awareness about environmental, health, and animal welfare factors. These changes were initiated by past events or in anticipation of future events.

2.4.1.2 Liking and Desire for Meat and Dairy

Participants described their liking of meat and dairy, and their desires to eat these foods. These desires varied in strength (e.g., urges, cravings, or temptations). Some participants struggled with the idea of completely cutting out meat, because they would miss the enjoyment from eating it (e.g., P55, F). They expressed how effortful they found it to eliminate these foods from their diets, especially when the sensory features of the foods triggered desires for meat and dairy (e.g., P66, F; P13, M), such as their smell, taste, and texture.

Some participants described hunger as a factor that hindered their meat and dairy reduction, and some shared experiences of not feeling satiated after vegetarian dishes (e.g., P6, F). They also mentioned that it was easier to reduce meat consumption during the summer months, as opposed to winter, due to their desire for comforting foods in winter (e.g., P59, F).

Some participants justified their strong cravings by tying them to their felt bodily changes or perceptions of nutrition deficiencies such as iron and Vit. B12 (e.g., P38, F; P18, F). Many described that moods, such as feeling forgetful, distracted, lazy, stressed, or bored, triggered desires to eat more meat or dairy (e.g., P74, M; P26, F). A few participants shared experiences with feelings of idleness and tiredness towards the end of the week or day. In these situations, participants chose comfort, familiarity, and convenience, over the harder task of resisting meat. For supporting quotes, see Table 6.

Table 6 - Data extracts for Sub-theme 1.2.

Liking and prompted desires of meat and dairy.	
Missing meat	"I like the taste of meat so it's hard to consider cutting it out altogether as I'd miss chicken, bacon etc." (P55, F)
Desire triggered by thoughts of sensory features	"I often craved the taste of cheese on toast." (P66, F)
Desire triggered by sensory features	"The smell of bacon would, even years after abstaining… the smell of it frying would make my mouth water and stomach growl." (P13, M)
Craving triggered by low satiety	"Sometimes, I crave meat and fish. Veggie meals just don't fill me up enough." (P6, F)
Desire for meat/dairy triggered by winter	"But in the colder weather, I'm finding it more of a struggle. I think people crave filling stodgy food in the colder months, where in summer I'm happy with something like a jacket potato with salad." (P59, F)
Craving for meat due to iron deficiencies	"When I have my period, I craveeee red meat which I'm assuming is because of my iron levels or something? I always want red meat for that whole week which is hard." (P38, F)
Craving for dairy due to B12 deficiencies	"I eat healthy versions of yoghurts to help with my B12 deficiency and I am trying hard to not eat them." (P18, F)

Laziness leading to meat as a convenient choice	"I would say later in the week when I am feeling lazier about cooking food, it feels like a chore to find an unfamiliar vegetarian meal that I need to cook from scratch." (P74, M)
Emotional eating prompted by lapsing	"Initially if I feel frustrated in any other issue, the first thing I do is stress eating, and mainly meat. I found that as a negative habit and I gradually got out of it." (P26, F)

In sum, participants described liking and desires for meat and dairy foods. Internal situations such as hunger, health concerns, and various mood states often prompted the desire to eat meat or dairy.

2.4.1.3 Experiences of Conflict Resulting from Incompatible Motivations

Most participants experienced a range of conflicting motivations in many situations prior to and after consuming meat and dairy. The uncomfortable experiences of cognitive dissonance, where one's actions are not in line with one's beliefs, left some participants feeling guilty. Participants varied in their detection of conflict and motivation to control these difficulties and efforts. Some reported not feeling conflicted, felt comfortable bypassing the dissonance and justified why they do not want to fully eliminate meat or dairy (e.g., P53, M).

Participants described the conflicts between their desires to consume meat and dairy and their longer-term reduction goals. For instance, some felt conflicted between the desire to follow through with their new habits and the desire to consume comforting foods. They also mentioned the desire to eat a plant-based diet and to eat a nutritious diet, which requires additional awareness and research (e.g., P5, F). Others experienced strong desires to consume meat and dairy despite their awareness of the environmental and moral impacts of where their food was sourced from (e.g., P70, F).

At times, falling back into old habits and consuming meat and dairy also led to other emotional experiences of conflict, such as feeling disheartened (e.g., P57, F), worried, less determined, or even questioning own beliefs and reasons for wanting to reduce (e.g., P18, F). Finally, participants described conflict arising

from having to choose from many options that vary on many dimensions (e.g., ethics, nutritional qualities, or taste) and from having to deal with conflicting information (e.g., P52, F; P32, F). For supporting quotes, see Table 7.

Table 7 - Data extracts for Sub-theme 1.3.

Experiences of conflict resulting from incompatible motivations.	
Bypassing cognitive dissonance	"On some level, I know there is cognitive dissonance. I can never TRULY justify factory farming etc... but I seem to have been able to bypass that quite comfortably." (P53, M)
Conflict between desires and goals	"Another challenge has been ensuring that I am getting the right nutrients from a plant-based diet. This takes some research. I also feel conflicted about wanting to stick to my new habits but also wanting to eat some comforting food." (P5, F)
Conflict between desire to eat meat and environmental awareness	"I sometimes feel conflicted as I do enjoy the taste of some meats, but I also understand that mass meat production burdens the environment." (P70, F)
Feeling disheartened from falling back into old dairy habits	"I was however disheartened at how easily I changed back; I immediately preferred dairy milk in hot chocolate, and it made going back to oat milk more difficult than the first time." (P57, F)
Negative affect from falling back into old dairy habits	"I feel like greed is overtaking my beliefs at times, and that I should be stronger and not eat dairy." (P18, F)
Conflict from too much choice	"I also feel overwhelmed at times trying to figure out how to make the most ethical choices when I shop for food products." (P52, F)
Decision conflict from incompatible motives	"With milk, do you choose almond or oat etc? Then there's the fact that I'm told a lot of the dairy alternatives are just as bad, if not worse for the environment than what meat is." (P32, F)

Overall, participants mentioned the many internal conflicts between their desires for meat and/or dairy and their longer-term reduction goals. As a result,

they described cognitive dissonance, negative affect, and the struggle to balance sustainability, health, and taste.

2.4.2 Barriers, and Sometimes Support, from the Food Environment and the Social Environment

2.4.2.1 Barriers from the Food Environment

Participants noted that the food culture in the UK normalises meat and dairy consumption. Participants found it effortful to maintain resistance against the mainstream environment that normalised eating these foods since childhood (e.g., P25, F; childhood conditioning: P49, F). The availability of meat and dairy alternatives and the proximity and distribution of food shops affected participants' dietary choices. Participants who had started reducing meat and dairy intake several years ago reported that the availability of alternatives was much better now than in the past (e.g., P36, F). Nonetheless, most participants described that local food environments (e.g., shops, take-away food outlets, restaurants) were not particularly encouraging of vegan and vegetarian eating. However, this was better in summer (e.g., P17, F).

Most participants found vegan and vegetarian eating more difficult when eating out than at home. Although our survey was conducted during the COVID-19 lockdown, when restaurants were closed, participants described the lack of availability of meat-free or dairy-free options when eating out in the past (e.g., P40, M; P38, F). In contrast, most participants found eating at home was effortless, especially if they were in control of the food (e.g., P38, F). However, special occasions, such as Christmas, were challenging, mainly because they encouraged old habits of eating traditional foods and reduced participants' sense of control (e.g., P41, F).

Affordability was another factor influencing participants' food choices. Many mentioned their willingness to try meat and dairy alternatives, but found those foods more expensive than the foods they were trying to avoid (e.g., P38, F). Meat promotions enhanced participants' temptations to consume meat in restaurants when they wanted value for money (e.g., P51, F). Health-motivated participants avoided meat alternatives that they considered 'highly processed' and sought to source more expensive but higher quality meat from local or

organic stores (e.g., P49, F). Participants reported feeling conflicted or uneasy (e.g., P30, F) when the food environment prompted them to make choices incompatible with their reduction goals (e.g., P5, F), for instance, when they wanted to order take-out foods and there were few or no meat-free options. For supporting quotes, see Table 8.

Table 8 - Data extracts for Sub-theme 2.1.

Barriers from the food environment.	
Cultural norms	"If it were more normalised to eat meat and dairy alternatives, I think it would be much easier for people who want to be vegetarian or vegan to make changes in their diets, including myself. If it weren't so embedded in our society to eat meat and dairy, it would be a lot easier." (P25, F)
Childhood conditioning	"It's tricky as I have been raised with the attitude that it isn't a proper meal without meat." (P49, F)
Increasing availability and improvements across time	"Making products more accessible would be useful. I know there's been a whole lot of improvement but there's still a fair way to go I reckon." (P36, F)
Seasonal availability	"It's obviously easier during the summer months when fruits and veggies are in more abundant supply." (P17, F)
Efforts vary in contexts	"I find it can really vary in how easy it is. Sometimes, if I'm at a local restaurant and the vegetarian options are really poor, I will be tempted to order a meat dish instead." (P40, M)
Traditional meals	"When it comes to occasions like Christmas, I just find it difficult to resist the traditional meal and tend to join in with the excuse that it's only once or twice a year." (P41, F)
Efforts vary across contexts (home vs. eating out)	"If I'm home in lockdown and cooking for myself, it's easy to get into a routine. Some weeks it's much harder, i.e., coming out of lockdown and heading to all my favourite old restaurants." (P38, F)
Affordability of meat and dairy alternatives	"The main challenge I have found has been the cost of meat and dairy alternatives" (P38, F)
Meat promotions	"I remember eating a large steak with a creamy sauce in a restaurant. […]. It was cheaper on that day. I felt it

	was a very good deal to get so much steak for a lower price, so I ordered it." (P51, F)
Meat quality	"I would rather pay more for better quality and well looked after meat. Paying more though, means eating less." (P49, F)
Conflict due to lack of availability of meat alternative options	"I often feel like this [conflicted], especially if I want to order a takeaway but also don't want to eat meat." (P5, F)
Conflict due to availability of meat or dairy options	"I often feel conflicted knowing that chocolate or a lot of takeout options contain meat or dairy and when the temptation is there, the aftermath is usually feeling quite disappointed." (P30, F)

Overall, participants' responses evidence the influences of the food environment on their choices. The availability of foods, environmental food cues in different contexts (e.g., shops, in restaurants, at home generally, or at home during special occasions), and affordability impacted participants' purchase and consumption decisions. This, in turn, often led to experiences of conflict.

2.4.2.2 Barriers and Support from the Social Environment

Many participants mentioned negative social perceptions of specific dietary groups. Self-reported vegetarians and self-reported omnivores both negatively perceived the flexitarian label (e.g., P69, M; P21, F). Although some participants identified as flexitarian, they found the term flexitarian vague and unclear, did not necessarily want to be identified as a flexitarian in their social context (P23, F), and indicated that this unclear dietary category may not be taken seriously by others (e.g., P29, F; A, P18, F). In addition, many participants and their social circles perceived vegans or vegetarians as a clear out-group (e.g., P14, F). Regardless of identification, participants reported perceiving negative attitudes from others that led them to doubt their own beliefs, negatively impacting their behaviour. While most of these impacts came from close family members (e.g., B, P18, F), a few participants reported being hindered by friends (e.g., P40, M).

Participants' sense of control diminished around others who consumed meat and dairy. Some reported feeling conflicted in these situations and found giving in

was the easier choice (e.g., P34, F). Another significant barrier to participants' reduction was the traditional mindset of older generations around food (e.g., P41, F). When participants were offered foods containing meat or dairy, they did not refuse these foods, because they feared causing inconvenience to others (e.g., P4, NB) or wanted to avoid the confrontation (e.g., P71, F).

For some participants, having different diets within the household was a major barrier, causing additional expenses and food waste (e.g., P5, F). Others reported having full support from members of their household who were also reducing meat or dairy intake, or were reducing for longer periods of time. The variability in support impacted participants' enjoyment and effort. For many participants, social support facilitated their reduction maintenance. Participants felt validated and encouraged by social support and others' reduction efforts (e.g., P5, F), which increased their self-efficacy (e.g., P37, F). For others, however, this was more challenging: for example, a male participant reported facing stereotypes around men for trying to reduce the consumption of foods commonly associated with masculinity (e.g., P40, M). For supporting quotes, see Table 9.

Table 9 - Data extracts for Sub-theme 2.2.

Barriers and support from the social environment.	
Vegetarian reducer – unhelpful label.	"I'm a vegetarian. Being a flexitarian is pointless, you either eat meat or you don't." (P69, M)
Omnivore reducer – perceived unworthy of other labels.	"I see myself as a meat-eater still as I don't think I deserve to label myself as any other yet." (P21, F)
Flexitarian reducer – unhelpful label.	"[I identify as a] flexitarian. Although the term is not one I would use to describe myself to others, I would say I am reducing my intake. The term seems made up." (P23, F)
Negative perceptions of vegetarians	"I can imagine the idea of going vegetarian being the classical "but you don't make friends with salad" jokes" (P14, F)
Negative aspect of dietary identification	'Why do people have to make such a fuss of what we do and don't eat, is what I often wonder. If asked I will say. It is personal choice, and I don't like labels.' (A, P18, F)
Impact of negative attitudes from family and others	"My family would criticise my diet and would or could not understand my reasons. Other peoples' responses have upset me in the past. They have made me

	question my beliefs. They have also made me more determined." (B, P18, F)
Toxic masculinity	"I have often had ridicule from friends. My circle of friends can be quite full of toxic masculinity, and not eating meat is seen as a weakness." (P40, M)
Conflict from eating with people who eat meat	"[I feel conflicted] All the time. Again, it's worse when I go out and if someone else gets something really good looking or smelling like meat when I've convinced myself that it's veggie day." (P34, F)
Conflict dependent on context	"It's more difficult when eating out, or especially when visiting family. My parents have some set habits around cooking and stick to a range of quite traditional meat meals." (P41, F)
Perceived inconvenience	"I don't feel right forcing her [my mother] to prepare a separate meal/generally causing an inconvenience with food." (P4, NB)
Fear of confrontation	"My extended family were focused on the fact that I wasn't eating meat at large amount when I met up at Christmas […]. It sparked a lot of debate and I hated being the centre of that attention. This has definitely influenced me in terms of not being as strict as I should be. I now eat meat when I go to their house to avoid this attention." (P71, F)
The challenges of holding different diets within a household	"The main challenge for me has been that my partner does not want to reduce his consumption of animal products and it is not easy to cook two separate meals, it seems wasteful and more expensive." (P5, F)
The benefits of holding similar diets within a household	"I have been doing this challenge with my wife which makes it a lot easier. We are able to cook things together and support each other." (P40, M)
Social validation and support	"I do feel influenced and affected by friends' opinions of me. I look to be validated by my social circle and they help me." (P5, F)
Social support and behavioural contagion	"It helps me when there are people around me doing the same and encouraging me." (P37, F)

In sum, attitudes towards dietary groups affected participants' desire to identify with them. Many participants' responses highlight the social challenges they encountered when changing their diet, while some also reported supportive social influences, especially from others with similar dietary goals.

2.4.3 Management and Strategies of Conflicts and Efforts

2.4.3.1 Resolving Internal Conflicts.

Low-effort strategies, such as behavioural substitution, were most helpful, because they provided comfortable and small changes that fit participants' reduction and environmental goals, but also their liking and taste. These strategies entailed, for example, increasing the consumption of vegetables, other types of animal-based proteins, plant-based alternatives, or meat of better quality (e.g., P78, M; P22, F). Participants also emphasised positive feedback strategies or rewards from experiencing health benefits from their dietary change, which helped maintain their motivation (e.g., P36, F). Additionally, participants often re-evaluated their goals through this feedback process. They assessed their new habits, successes and failures, or enjoyment of their reduction experience, encouraging them to pursue their reduction goals further (e.g., P12, F).

Some participants acknowledged the effort and perseverance required for forming new habits, mentioning willpower, self-determination, and willingness. Once they experienced achievements and new habits, their confidence and self-efficacy increased, while the effort needed to manage barriers decreased (e.g., P43, F; P35, F). Participants noted that the process of changing their behaviour was often messy. They employed reframing strategies to accept the efforts needed to deal with challenging situations and reduce the dissonance when they had not acted according to their reduction goals. Such reframing was often effortful, but participants reported rewarding themselves for their efforts and progress when abstinence from meat and dairy was successful (e.g., P27, F; P26, F). They adopted a flexible mindset to help resolve and balance conflicting motivations (e.g., P60, F).

To stop themselves from consuming meat or dairy when feeling tempted, participants used cues or reminders of the health effects of eating meat and of the negative impacts of meat and dairy on the environment, future generations, and animal welfare. These reminders increased their sense of agency and impact on the world (e.g., P51, F; P18, F). Some participants described cooking new recipes as a strategy to deal with desires to consume meat and dairy, starting

with small, achievable cooking tasks, while increasing the variety of dishes they could prepare to fuel their sense of enjoyment (e.g., P30, F; P68, M). Finally, some participants reported simply liking meat and dairy alternatives more as time passed (e.g., P30, F; P24, M). This shift in liking may result from associative learning from their social context or the increased exposure to these alternative foods. For supporting quotes, see Table 10.

Table 10 - Data extracts for Sub-theme 3.1.

Resolving internal conflicts.	
Low-efforts strategies: easy substitutions	"I maintain by not changing my meals, just replacing meat with veggie alternatives. So, I can still eat the food I like but without the guilt. Earlier this week, I used mushrooms instead of chicken in fajitas." (P78, M)
Low-efforts strategies: small changes	"The fish and vegetable increase in our diets has been maintained and therefore the lowering consumption of meat has also been maintained." (P22, F)
Rewards from tangible health benefits	"And while my main goal is environmental, I do definitely feel better and healthier when I don't consume dairy. Sometimes that is an easier motivator to focus on when I need an extra boost." (P36, F)
Goal malleability	"I've not stuck completely to Meat Free Monday, which was an intention, but I've stuck to reducing meat by 50% in each meal we eat." (P12, F)
Perseverance strategies; time and patience	"Very confident and a lot of it is habit and retraining your brain to think differently. It may take more time and effort to change, but it is worth it." (P43, F)
Perseverance strategies; willingness and openness	"Being willing to try new things and don't just stop keep trying till you find what works for you." (P35, F)
Reframing strategies: meat as a reward	"I find Sunday roast is keeping my meat intake going. I look forward to it and see it as a treat and a reward for abstaining all week." (P27, F)
Reframing strategies: self-reward	"Now, I have started to congratulate myself if I didn't eat meat for a month." (P26, F)
Reframing strategies: Flexibility	"I feel that having an all or nothing approach may not be particularly helpful in helping you achieve goals, and that feeling 'guilty' about something isn't

	necessarily productive. So, whilst I do feel conflicted, it's [lapsing is] not the end of the world." (P60, F)
Reminder of the health implications	"I think of the amount of cholesterol and fat that is going to line my arteries: "This will lead me to a heart attack. I will die because I wanted to eat more beef." This is very effective in stopping me from eating beef." (P51, F)
Reminder of environmental and ethical implications	"Effective ways that help me reduce dairy are to think about where the food originates from. I think about the animals and their welfare. I think about the brutality in the milk industry plus the negative health aspects of eating dairy." (P18, F)
Initial cooking strategies: increasing variety	"I also try to research recipes when bored and find easy ones to start with to build up more meal options." (P30, F)
Enjoyment and increasing variety	"I introduced new foods to my diet which I'm really enjoying. So far, I have stuck to it. […]. I think the key is variety and I've found plenty of options on food I can eat which does not contain meat." (P68, M)
Developing a liking for alternative foods	"I have developed a real liking for tofu and tofu-based recipes which has helped." (P30, F)
Developing a liking for non-meat foods	"I was a very big meat-eater. A meal without meat didn't seem like a meal to me. After about two weeks there was a switch in my brain. I started to see non-meat meals as perfectly acceptable alternatives." (P24, M)

In sum, participants evidenced both low-effort substitution and effortful reframing and reminder strategies to manage their internal struggles and conflicts throughout their reduction experience. Experiencing tangible health benefits helped participants maintain their efforts.

2.4.3.2 Resolving Conflict from Food and Social Environments.

Participants resolved conflict from food environments with various low-effort strategies, such as avoiding the exposure to tempting foods (e.g., P48, F) and tempting choice situations (e.g., P1, F). Participants also used communication strategies, for example, when they feared causing inconvenience to others or when others had ignored or forgotten their diet (e.g., P30, F). Others hid their

dietary identity from others to minimise negative perceptions (e.g., P36, F), and sometimes gave in to temptations in social situations, compensating later by restricting their meat consumption (e.g., 71, F).

Action planning and meal planning were described as very valuable, and helped with time management, effort, and mindfulness. Participants used planning to increase the availability of non-meat or non-dairy meals at home, including freezing plant-based and prepared foods (e.g., P15, F; P16, F). Some participants rejected negative mainstream perceptions of vegans and vegetarians. Those surrounded by others with previous experience in reducing their meat and dairy intake, for instance, vegans and vegetarians, found their support helpful (e.g., P4, NB), for example, for discovering and exchanging recipes and for holding each other accountable. For supporting quotes, see Table 11.

Table 11 - Data extracts for Sub-theme 3.2.

Resolving conflict from food and social environments.	
Avoidance of exposure	"Avoiding meat aisles helps any temptation." (P48, F)
Avoidance of choice situations	"We order shopping online now. We do a weekly shop and that is all we get. It doesn't make us go and buy something we shouldn't." (P1, F)
Communication strategies	"I did sit him down the next day and explained why I didn't want to eat so much of these foods, and it would help if he found alternatives on occasions like this, which he has started to do." (P30, F)
Absence of communication: hidden diet	"I keep it [my diet] to myself as best as I can to avoid issues." (P36, F)
Compensation after eating meat	"I do eat meat when it's easier to. In my own time when it only affects me, I try to be stricter." (P71, F)
Increasing availability of vegetarian food at home	"Making sure I have veggie convenience food in stock for those time pushed moments." (P15, F)
Action/Meal planning	"Meal planning is most effective […]. It means I am prepared when I do my grocery shopping, buy food accordingly, and then prepare meals more mindfully.

	If I did not meal prep, I would make dinner last minute and not be so conscious about the food I am buying/preparing." (P16, F)
Support from experienced others	"It was also helpful that a lot of my friends were vegan." (P4, NB)

Overall, participants used strategies such as avoidance, communication, action planning, and recruiting social support to resolve the conflicts between their dietary goals and the food and social environment.

2.4.3.3 Wishful Suggestions: What I and Others Could Do.

Participants described what they or others could do to make their reduction experience easier and more enjoyable.

Participants mentioned individual-level strategies (n = 10), stating that these mainly relied on self-control (n = 7). Participants also mentioned increasing their knowledge through recipes, videos (n = 4), and following social media accounts (e.g., P38, F) to maintain their motivation or continue with their improvements (n =2). One participant mentioned the need to communicate more effectively with others to reduce temptations when offered meat (e.g., P20, F). As a result of contentment with their dietary reduction, some mentioned contemplating further reduction after receiving a new cookbook (e.g., P49, F).

Many participants mentioned interventions they would like others to do, mainly organisations (n = 61), such as increasing availability, accessibility, and variety of foods in supermarkets and accessibility to easy and creative recipes (n = 57), availability of fresh fruits (n = 1), and accessibility and availability of "ethical" meat (n = 2). Participants wanted supermarkets to promote healthy, meat-free, dairy-free food options, rather than only unhealthy ones (n = 25). They also mentioned policy interventions that would increase taxes on the cost of meat (n = 2) (e.g., P9, F) or ban factory farming (n = 1). Others mentioned the need for better advertisement (e.g., P35, F), making vegan alternatives more attractive and meat and dairy foods less attractive (n = 2).

Participants wanted more support from their family, partners, or children (n = 24), and mentioned wishing that their social circle or the general population followed the same diet as them (n = 20). Participants mentioned that their social circle and the general public needed to better understand the negative impacts of the animal industry on the environment (n = 7) (e.g., P13, M) and the impacts of their choices (n = 1), although most emphasised that diet is a personal choice (n = 79) (e.g., P11, F). One participant mentioned that shifting social norms would help.

One participant proposed developing a phone application to increase their sense of community, exchange recipes, and receive feedback on environmental impact (e.g., P71, F). Participants also suggested the need to improve the taste, texture, and quality of sustainable foods (n = 11), especially the taste of cheese alternatives (n = 6). For supporting quotes, see Table 12.

Table 12 - Data extracts for Sub-theme 3.3.

Wishful suggestions: *What I and others could do.*	
Education through media	"Following lots of environmental pages to stay educated and encouraged." (P38, F)
Reinforcing communication strategies	"I also need to be more vocal and ask people to stop offering me meat - because I really enjoy eating and I don't really ever refuse it." (P20, F)
Personal choice and education	"It is a personal choice, and I don't think it is up to supermarkets or environmentalist to pressure you, but some non-pushy education on the health benefits and environmental benefits can help." (P11, F)
Satisfaction leads to contemplation on further reduction	"I'm really happy with how things are going so far. I may try to introduce another meat-free day in the new year if I receive the meat-free cookbook I have requested for Christmas." (P49, F)
Taxation	"If the government put tax breaks on vegetarian food to make them cheaper." (P9, F)
Promoting healthy foods and attractiveness of advertisement	"Promotions in supermarkets would help as seems all promos are for unhealthy foods snacks. Make the advertisements for meat and dairy products less appetizing." (P35, F)

Need for education and understanding impact of choices	"People need to be educated on the impacts of their choices, shown the facts of production, the factory farms, the deforestation, soil erosion and climate change being all inter-connected." (P13, M)
Digital application for belonging, accountability, and motivation	"Having perhaps an app [phone application] where you can post pictures of your meals to have accountability. E.g., seeing that we've gone x number of days without meat, but doing this you've saved x amount of carbon emissions, […] to make it a little more tangible." (P71, F)

Note. Some of the suggestions mentioned by participants were somewhat similar to the strategies listed in subthemes 3.3.1 and 3.3.2. To avoid repetition, we only evidenced participants' extracts in this table if they were not previously mentioned.

2.4.4 Additional Exploratory Analysis

Dietary self-description in the main study was not always consistent with the pre-screening self-identification, particularly for omnivores and flexitarians. For instance, 17 participants who self-identified as omnivores or flexitarian in the pre-screening study later chose not to identify with any dietary group. Similarly, 43 participants who identified as omnivore or flexitarian in the main study reported that they would not choose these labels to identify themselves in social settings, despite choosing an appropriate label (e.g., "*To be honest, I'd never heard of Flexitarian until now. But I guess I am flexitarian then."* P68). All participants mentioned the importance of being flexible with their diets. When given the opportunity to express their dietary identity openly through open-ended questions, some of the self-reported omnivores and flexitarians deviated from their previous dietary identification responses. They reported instead that they preferred not using any label, possibly because this better depicts how they present themselves in their daily lives (e.g., "*I just see myself as a person who eats meat. I am unsure what a flexitarian is*.") or because the pre-screening question on diets was multiple choice, whereas the question in the main study allowed for open responses.

These findings could be important to consider in future studies. As lay people's representations of how they identify themselves may differ from that of researchers, researchers interested in the behaviour of reducing meat and dairy intake should consider not recruiting participants using labels such as

"flexitarian", but rather by focusing on the behaviour of reducing. For further details on this exploratory analysis, see OSF.

2.5 Discussion

This study was designed to explore the experiences of environmentally motivated meat and dairy reducers from a self-control perspective, particularly to understand the role of habit, identity, and social norms in this transition.

2.5.1 Summary

Our analysis generated three main themes. The first theme reflects conflicting motivations and the need for self-control in reducing meat and/or dairy intake. The second theme illustrates the influence of food and social environments, such as availability and cost of foods, attractiveness of meat and dairy-based dishes, as well as negative social feedback and social support that impacted behaviour change. The third theme captured the strategies that participants used or said that they could use to help manage the conflicts and challenges resulting from their conflicting motivations and from their food and social environments. The preferred strategies were food substitutions and avoiding temptation. Graça et al. (2019) have suggested that further research is needed to better understand barriers and enablers of the individuals' capability, as well as aspects of the environmental opportunities, that may hinder or promote sustainable behaviour change. Our work addresses this and shows that self-control resources, social environments, social identity, and affordances of the food environment play key roles in the reduction process, and that dietary identity challenges and the need for self-control vary across situations.

2.5.2 Links With Existing Research and Theoretical Implications

2.5.2.1 The Need for Self-Control

One of the aims of this study was to explore the need for self-control in reducing meat and/or dairy intake. We found that most participants experienced self-control conflicts and, at times, cognitive dissonance and doubts. Self-control conflicts arose when goals to reduce meat and dairy intake were incompatible with desires and habits. We also observed conflicts between two incompatible

goals (e.g., reducing meat intake and saving money). For instance, participants found it difficult to choose tasty, sustainable, and healthy foods to replace meat or dairy. Consistent with self-control theories (Inzlicht & Schmeichel, 2012; Kotabe & Hofmann, 2015), we found that detecting conflict prompted self-control processes, and these were often experienced as effortful.

In line with dual-process theories (Hofmann, Gschwendner, et al., 2008), our results suggest that automatic processes (e.g., desires and habits) often overrode controlled processes (e.g., deliberate pursuit of long-term goals), especially when resources were depleted. In such situations, for example when they felt stressed or tired, participants preferred the convenience of eating familiar foods. Self-control research indicates that working memory capacity and other factors moderate self-regulatory outcomes (Hofmann, Gschwendner, et al., 2008). Future research could examine which self-control moderators are most important in the transition to sustainable eating.

2.5.2.2 Behaviour Maintenance Strategies

In line with health behaviour change maintenance research (Greaves et al., 2017; Kwasnicka et al., 2016), our findings suggest that self-regulation of thought and behaviour is essential for dealing with sources of tension during behaviour change maintenance. Participants used various strategies for this. Effortful strategies included persistence, reminders, action planning, meal planning, and effective confrontations with challenging social influences. Low-effort strategies included the avoidance of choice situations, and easy and comfortable meal substitutions. The effort required for reframing strategies varied across participants. Adopting a flexible mindset as well as being open to experiences encouraged persistence and acceptance of lapses. Most participants reported continuously seeking out information from the media. This strategy fuelled the maintenance of the reduction behaviour.

Our findings are consistent with research suggesting that people who identify as vegetarians may be more open to experiences (Milfont et al., 2021), and this personality trait may make sustained dietary change easier. It is possible that, compared to people making health behaviour changes, environmentally motivated meat and dairy reducers are more intrinsically motivated, which

might help their behaviour change. At the same time, it is possible that meat and dairy reducers are extrinsically motivated by social norms. Future research could address the role of intrinsic and extrinsic motivation in the maintenance of sustainable eating behaviour.

2.5.2.3 The Role of Social Identities

Our research points to the important role of social identities in the reduction of meat and dairy intake. Consistent with previous findings (Rosenfeld & Tomiyama, 2021b), participants' self-reported meat and dairy consumption did not map perfectly onto dietary identities; for example, some flexitarians reported eating more meat than some omnivores (see Section 3.4). Aligned with previous findings (Rosenfeld & Burrow, 2017; Rothgerber, 2014a), our findings suggest that participants' reports of belonging to a dietary group were based on their commitments to their reduction efforts, their social identification, dietary motivation, and adherence.

Additionally, our study adds insight into the highly variable ways in which people conceptualise their dietary identity. A large proportion of our participants who self-reported as omnivores or flexitarians in the pre-screening also reported negative attitudes towards dietary labelling (see Section 3.4) in the main study. Possibly, dietary identification varies over time, and those with more variable diets do not find these labels helpful. There was less resistance to dietary labelling among self-reported vegetarians, compared to other participants in our study. The reason could be that vegetarians' identity is more central to their sense of self (Rosenfeld & Tomiyama, 2019).

Our findings are in line with the identity-based motivation theory (Oyserman, 2015), which suggests that differences in context change people's self-concept and identity-related motivations. For example, participants reported that eating a vegetarian diet was easier in situations where their reduction goals were salient, and where identity conflict was low. However, when eating out with friends, some participants chose a meat-based diet to conform to the friends' group norm. In other words, reducers seemed to juggle multiple diet-related identities that differ in salience across situations and prescribe different behavioural norms. This can explain why meat and dairy reducers prefer a

flexible identity, although this is not always helpful for their reduction efforts. This is in line with previous research suggesting that identities can be seen as dynamic and fluid (Brubaker & Cooper, 2000), and suggests that this is very much true for food identities at the initial stages of dietary change, where individuals attempt to establish a new identity to categorise and define their eating behaviour.

More generally, our findings suggest that identity plays a key role in behaviour change, and might warrant more central integration in behaviour change models, such as the COM-B model (Atkins et al., 2017), where identity could be considered as affecting subjective social norms (Gkargkavouzi et al., 2019), or the Transtheoretical Model of Behavioural Change (Prochaska et al., 2008), where identity processes could play a role across phases. Specifically, our findings suggest that social interactions polarised the meat and dairy reduction identities. While previous research shows that flexitarians may be less stigmatised than vegans (Rosenfeld, Rothgerber, & Tomiyama, 2020), our findings indicate that flexitarians experienced social resistance to their diets as well. The vast majority of participants spontaneously highlighted that their eating behaviour was a personal choice, and participants found that identifying with a dietary group provoked negative stereotypes and social perceptions. At the same time, participants who found the vegan and vegetarian identity helpful mentioned having rewarding support from those groups. Indeed, identification with social groups that engage in meat and dairy reduction could help increase reducers' motivation and satisfaction with their dietary change.

In contrast, identification with groups for whom eating meat is normative could hinder reduction efforts by increasing the likelihood of social conflict or encouraging desires to consume meat and dairy. Previous research has shown that vegans tend to score lower than omnivores on the personality trait of agreeableness (Milfont et al., 2021), which might make it easier for them to disengage from prevailing social norms, and radically change their diet. Future research could explore how social interaction impacts meat and dairy reducers' sense of identification with a dietary group, and the role of personality traits in the management of these social influences.

Our findings on identity mechanisms in behavioural change are also relevant to spillover effects. Previous research has explored, for example, the spillover of sustainable eating between home and work settings (Verfuerth et al., 2019). Environmental identity has been previously shown to mediate the effect of spillover on pro-environmental behaviours (Truelove et al., 2016), while more recently, this effect was not found (Xu et al., 2018). Our findings suggest that the settings that are studied in spillover effects should also be considered for their differing social influences, for example, eating with close family vs eating with colleagues, as the social identities activated by these situations matter. Understanding the social and identity dynamics of the different situations could help us understand exactly when spillover occurs, and when it does not.

2.5.2.4 Habits and Reward

In line with habit research, our findings show that forming new habits played a key role in participants' reduction efforts (Gardner & Rebar, 2019; Lally & Gardner, 2013). Participants' sense of automaticity increased when they repeatedly avoided eating meat and dairy. This was achieved through behavioural substitutions, through the consistent repetition of the new behaviour (e.g., eating plant-based meals), and through reward (e.g., peer support and self-reward).

In line with the Grounded Cognition Theory of Desire (Papies, Barsalou, et al., 2020; Papies et al., 2017; Papies & Barsalou, 2015), we found that habitual situations prompted mental simulations of eating and enjoying meat and dairy foods, which triggered desire, and at times, led participants to consume these foods (see Papies, Claassen, et al., 2021; Papies, van Stekelenburg, et al., 2022). For instance, desires were triggered by internal situations, such as hunger or certain mood states, or by external cues such as the sight or smell of liked foods. Especially when participants felt low in self-control resources, the desire to consume habitual foods was stronger. This suggests that participants' meat and dairy consumption habits were driven by expectancies of enjoying these foods, which is in line with the perspective that habitual behaviour is goal-driven (Kruglanski & Szumowska, 2020).

2.5.2.5 The Complexity of the Reduction Behaviour

Our findings suggest that different related behaviours may support each other and interact in the different stages of behavioural change. As an example, engaging in meat reduction and reducing dairy may be interactive and mutually enforcing. Some participants who reported reducing dairy intake only reported having previously successfully reduced their meat consumption. It is possible that their success in one behavioural change informed their willingness and confidence to engage in another.

Additionally, our findings have implications for behaviour change models, for example, the Transtheoretical Model of Behavioural Change (Prochaska et al., 2008). While the Transtheoretical Model conceptualises the various stages through which an individual progresses during behaviour change as relatively distinct, we suggest that, for the complexity of the reduction behaviour, these stages are not mutually exclusive. In other words, individuals can find themselves in two or more stages at once. Most of our participants were reducing their meat and dairy intake and, therefore, engaging in two kinds of behaviour change, each with various strategies. For instance, some individuals reduced their meat portion size by 50%, only ate dairy when eating out, and planned to adopt meat-free weekdays. Future research would benefit from examining how related behaviours interact, and how this informs the progression between different stages of behaviour change.

2.5.3 Applied Implications

Our findings have implications for the development of interventions and policy considerations to support the shift to sustainable diets.

2.5.3.1 Creating Awareness and Motivation

Our research suggests that it may be useful to repeatedly expose the public to reliable information about the role of food in climate change. Participants shared that repeatedly seeking information gradually increased their awareness of the climate emergency and propelled them into action. This is in line with research showing that receiving fourteen daily messages on the environmental benefits of reducing meat intake changed participants' attitudes (Carfora et al.,

2019). Our findings suggest that the motivation to reduce meat and dairy intake may develop gradually, and that the public's awareness may progressively increase their willingness to reduce or engage in further reduction. A large proportion of participants' suggestions to facilitate this transition was about the increase of awareness and knowledge in their social circles and the need to normalise meat and dairy reduction. Thus, the reinforcement of knowledge may be important to initiate and support the reduction process.

A greater focus of intervention research on the environment and choice architecture (Arno & Thomas, 2016; Broers et al., 2017; Bucher et al., 2016) could help alleviate the decision conflicts observed in our study. Indeed, participants suggested changes in availability and pricing that could help reduce the effort needed for reducing meat and/or dairy intake. Participants also found choosing from many options stressful, task as they held many motives and considerations that needed to be balanced (e.g., healthy, sustainable, and tasty). Again, changes in food policy, for example affecting taxation, subsidies, and food procurement in the public sector, could support environmentally motivated dietary changes by increasing access to tasty, healthy, and sustainable options.

2.5.3.2 Identity as a Potential Intervention Target

Interventions supporting the transition to sustainable eating should consider the social identity of consumers, and ways to strengthen meat and dairy reducers' sense of identification with their dietary groups. This can be done by linking social identity to pro-environmental outcomes (van der Werff et al., 2014) and by promoting pro-environmental ingroup norms (Schultz et al., 2007), and could increase well-being and reduce doubt about dietary change. Social identity may also influence people's taste perception, such that identity-congruent foods are experienced as tastier (Hackel et al., 2018). Strengthening the dietary identity of consumers might further support them in their reduction experiences.

Additionally, the process of reducing meat intake may differ by gender; for example, social expectations around masculinity may deter men in their behaviour change process. Indeed, recent research has suggested that gender conformity is linked to meat consumption frequencies (Rosenfeld & Tomiyama,

2021). Understanding gender differences in how social influences impact people's meat and dairy consumptions can help strengthen efforts to improve the sustainability of eating patterns. Therefore, future work could consider the individual challenges across genders as to manage these and potentially strengthen their dietary identities with their decisions to reduce meat or dairy.

2.5.3.3 Taste, Availability, and Affordability

Policies to encourage sustainable and healthy eating must consider the taste, availability, and affordability of plant-based foods. Our findings suggest that small dietary changes helped participants stay engaged in their reduction efforts, as they led to experiences of success and new habits. Thus, attractive meat replacements continue to be important. Our participants also found that taste was a key factor in their efforts. In line with this, research has shown that labelling plant-based foods by emphasising taste and reward may be an effective and low-cost strategy to increase the appeal of plant-based foods among habitual meat eaters (Papies, Barsalou, et al., 2020; Turnwald & Crum, 2019) .

Finally, our participants reported that the lack of availability and affordability of attractive meat and dairy alternatives hindered their reduction efforts. Increasing the likelihood of people choosing plant-based foods is important and can be achieved by changes to the choice architecture, for example increasing availability (Garnett et al., 2019), using appealing language for plant-based foods (Papies, Johannes, et al., 2020; Turnwald et al., 2019), introducing financial incentives for sustainable alternatives (Willett et al., 2019), or shifting subsidies from animal agriculture to sustainable alternatives (Abadie et al., 2016).

2.5.4 Strengths and Limitations

A strength of our study lies in the transparency through pre-registration, and credibility strategies such as bringing in different perspectives, peer debriefing, reflexivity, and negative case analysis, which strengthened the robustness of our analysis process. Additionally, there are benefits to both researchers and participants when using qualitative surveys. Qualitative online surveys offer rich data from a broad representation of individuals and experiences to explorative

research. It provided us with diverse perspectives of the reduction experience. This diversity is useful when researching an underexplored area. At the same time, qualitative surveys offer participants full control over their research participation and bypass the traditional the power-dynamics of the researcher and the researched that takes place in qualitative interviews. In addition, participants' responses often provide more focused and targeted data as opposed to data from interviews (Braun et al., 2020; Braun & Clarke, 2013).

This study is not without limitations. First, online data collection risks excluding individuals from disadvantaged groups in society. Secondly, and as self-control theories guided our question generation, we acknowledge that our findings are limited in that participants were guided by the concepts introduced in the survey questions. In other words, it is possible that participants' responses referenced constructs such as habits and social norms because we asked about them, and that other aspects of the reduction process were less likely to be shared as a result. Future research may address this issue with either more open questions, or quantitative measures.

Despite the broad representation of experiences in our study, our findings remain contextualised within some boundaries. For example, our sample was predominantly female. It is possible that the processes involved in reducing meat and dairy intake differ between genders, as implied by one participant's comment on toxic masculinity. Additionally, our UK sample may also limit the transferability of our findings to different Western and non-Western cultures. Finally, only four participants of our sample were reducing only dairy intake. It is possible that the challenges and barriers for this group of reducers differ from the majority of the participants. However, our aim was not to ensure representativeness but to explore the diverse lived experiences of reducing one's meat and/or dairy intake. Future research would benefit from exploring demographic (e.g., gender) and cultural differences, as well as differences between meat and dairy reducers in self-control, identity, and the social influence processes that affect their experiences of changes in eating behaviour.

2.6 Conclusion

This study has developed a rich picture of the experiences of a sample of UK residents reducing their meat and/or dairy intake for environmental reasons. We found that reducers often experienced conflict between different desires, habits, and motives, and needed self-control resources to manage them. Small and comfortable changes were experienced as preferred and effective strategies to maintain the reduction behaviour. However, social challenges and unclear identities hampered dietary change. Interventions should address these processes to support a wide-spread transition to sustainable diets.

3 Chapter 3: Meta-stereotypes and their Associations with Eating Motivation and Identity Among Vegans and Meat and/or Dairy Reducers

This is an exact extract of the preprint:

Wehbe, L. H., Duncan, S., Banas, K., & Papies, E. K. (2023a). *Meta-stereotypes and their associations with eating motivation and identity among vegans and meat and/or dairy reducers*. PsyArXiv. https://doi.org/10.31234/osf.io/s54hg

All study materials and analysis are available on the Open Science Framework analysis, and can be found in the anonymised link on OSF https://osf.io/5ercp/, and https://osf.io/jzfrk/for Study 1 preregistration.

3.1 Abstract

Although plant-based diets are recommended to mitigate climate change, vegans, who implement those diets, are often negatively stereotyped. Here, we examined whether vegans and meat and/or dairy reducers perceive that others stereotype vegans, and whether such meta-stereotypes impact the motivation to adopt or maintain plant-based diets. We assessed stereotypes and meta-stereotypes of vegans among female vegans (Study 1, N = 200) and among female meat and/or dairy reducers (Study 2, N = 272) in the UK, and examined associations with the motivation to maintain dietary change and with identity. We found strong evidence for both stereotypes and meta-stereotypes. Both groups held stronger meta-stereotypes about vegans than stereotypes. Stereotypes were linked to how close reducers felt to vegans. Among both groups, there was no evidence of an association of negative meta-stereotypes with dietary change maintenance. Meta-stereotypes may reflect social polarisation, and may be relevant to examine for urgently needed societal changes.

Keywords: Meta-stereotypes, Identity, Climate change, behaviour change

3.2 Introduction

Reducing meat and dairy consumption has positive implications for health and is key to achieving climate targets for sustainability (Committee on Climate Change, 2018; Masson-Delmotte et al., 2019; Raphaely & Marinova, 2014; Whitmarsh et al., 2021). However, consuming meat is generally perceived as normal, natural, necessary, and nice (Piazza et al., 2015), and minorities that challenge these normative perceptions (e.g., vegans) are subject to negative stereotypes. In environments where consuming meat and/or dairy is the norm, individuals avoiding these foods may be aware of such stereotypes about vegans, which might activate beliefs about how one is perceived, a phenomenon known as meta-stereotyping. Meta-stereotypes may discourage people from reducing meat and/or dairy consumption, for fear that they would be subject to similar negative perceptions and attitudes. To the best of our knowledge, no research has attempted to investigate how vegans and meat and/or dairy reducers perceive omnivores stereotyping vegans (i.e., vegan meta-stereotypes), and what influence, if any, these meta-stereotypes have on vegans and reducers' dietary motivation and identities. This may be important to study as it may affect the societal transition to more sustainable diets. In two studies, we therefore investigated meta-stereotypes about vegans among vegans and meat and/or dairy reducers, and we examined whether holding these stereotypes is related to the motivation for following dietary patterns and the sense of closeness to vegans.

In the context of this research, we define 'meat and/or dairy reducers,' whom we will refer to as 'reducers' hereafter, as individuals who are reducing their meat and/or dairy consumption. Many of these individuals may be omnivores, vegetarians, or flexitarians. In contrast, vegans are individuals who completely eliminate both meat, dairy, and other animal products from their diets. While reducers are a group of individuals delineated by their behaviour, vegans are a dietary group distinguished not only by their food choices but also by their identity, which is associated with various beliefs, values, norms, and social processes (Vestergren & Uysal, 2022). In other words, reducers are not defined as a distinct social identity; rather, their behaviour is of interest to us (see also Wehbe et al., 2022).

What a person eats influences how they are seen by others (Higgs & Ruddock, 2020; Steim & Nemeroff, 1995). When choosing to include or exclude meat and dairy foods from their diet, people often communicate their sense of self, views of life, and sometimes, their social status or roles (Chen & Antonelli, 2020). The commonly used phrase 'You are what you eat' reflects the social phenomenon by which people attribute traits to others based on their food choices (Vartanian et al., 2007), especially when the diet goes against the mainstream, because this may be perceived as a threat to normative beliefs, values, attitudes, or moral standards (Lee et al., 2013). One example of such non-mainstream diet that challenges traditional dietary norms is veganism (MacInnis & Hodson, 2017; Povey et al., 2001; Ruby, 2012).

Research has long sought to understand how vegans are viewed in social contexts (Corrin & Papadopoulos, 2017; Lea et al., 2006). Choosing to eliminate meat and dairy foods goes against the norm and may lead to social costs, for example "do-gooder derogation" (MacInnis & Hodson, 2017; Rothgerber, 2020). This is because people unwilling to adopt behaviours that are moral can feel threatened by others (e.g., vegans) who they perceive as taking a moral stance (O'Connor & Monin, 2016). While omnivores (i.e., people who include meat in their diet) may perceive animal motivated vegans as morally committed because of their considerations for animals, the view that vegans are self-righteous, arrogant, and overcommitted, persists in societal discourse, for example on media platforms (De Groeve & Rosenfeld, 2022; Sanford & Lorimer, 2022).

According to the vegan paradox framework (De Groeve et al., 2021), vegans signal that consuming animal-based foods is harmful, challenging omnivores' beliefs around consuming animal products. As a result, omnivores experience the 'meat paradox', an internal conflict between their moral values and identity. To resolve this conflict, omnivores view vegans as moral, committed to causes like animal ethics, environmental sustainability, and personal health. Having such views increases omnivores' willingness to affiliate with vegans and consider adopting a reduced meat and/or dairy diet. However, omnivores may also reject the messages conveyed by vegans, denying that eating meat is harmful. This denial could shape negative perceptions of vegans as less 'normal' and less sociable, thus potentially pressuring vegans to conform to more conventional

dietary choices, in an attempt to reduce social tension and adhere to societal norms.

The pressure to conform to social norms may impact vegans in various ways, especially in social situations. Research has illustrated, for example, vegans' concerns around navigating difficult conversation with omnivores about their dietary choices and motives, reflecting experiences of social resistance when transitioning to a vegan diet (Buttny & Kinefuchi, 2020; Twine, 2014). Similarly, vegetarians often report that their dietary choices negatively impact their social interactions (Rosenfeld, 2018), and regular encounters with omnivores lead to experiences of anxiety about revealing their identity (MacInnis & Hodson, 2017). Even those who simply reduce their meat and dairy consumption without being fully vegetarian or vegan experience social challenges to their dietary pattern, such as having to explain, justify, or hide their food choices (Rosenfeld & Tomiyama, 2019; Wehbe et al., 2022).

A possible result of such experiences may be meta-stereotypes, such that vegans and reducers believe that others stereotype vegans. Meta-stereotypes have been defined as "a person's beliefs regarding the stereotype that outgroup members hold about his or her own group" (Vorauer et al., 1998, p. 917). In the context of meat and dairy reduction, vegans meta-stereotyping would mean that vegans (the in-group) believe that omnivores (the outgroup) stereotype vegans. Given that stereotypes about vegans are common, it is possible that they also manifest among reducers, such that reducers believe that omnivores (the outgroup) stereotype vegans (a group that one may feel relatively close to). In the context of this paper, we will refer to both stereotypes about vegans attributed to omnivores as "vegan meta-stereotypes", whether these are held by vegans themselves or by reducers. We suggest that these meta-stereotypes could reflect dietary polarisation (i.e., the division into different dietary groups with contrasting opinions or beliefs), and that they could negatively affect the motivation to continue reducing one's meat and dairy intake, in order to protect one's social identity. Both stereotypes and meta-stereotypes can have positive and negative valence. Negative stereotypes of vegans are more prevalent than the positives (Branković & Budžak, 2021). Therefore, valence could play a significant role in the effects of meta-stereotypes.

We used the social identity approach (Abrams & Hogg, 1990; Brown, 2000; Hornsey, 2008) to ground our understanding of how vegans and reducers view vegans within their social context. This approach suggests that people use social categorisation based on group memberships to make sense of the world. Thus, people's sense of self is derived from the groups they belong to, and their perception of others is also linked to group memberships – those who belong to the salient social group will be perceived as "us", while those who do not will be perceived as "them". Consequently, individuals strive to achieve a positive social identity by viewing their in-group as more favourable than the outgroup. Meta-stereotyping can be a result of such group differentiation, where people engage in comparisons with the outgroups to contribute to a positive sense of self. For example, vegans may actively distinguish themselves from omnivores, and hold strong beliefs that omnivores stereotype them negatively. This process may serve vegans to delineate themselves from omnivores to affirm their dietary and ethical choices. As veganism is a highly stereotyped social group, both vegans and reducers might be aware of how vegans are being viewed by others.

When vegans feel that they are negatively stereotyped, they may choose one of two strategies. They may either disidentify from the stereotyped group entirely, or distance themselves from the traits or behaviours that are the basis for the stereotype. For example, by actively working to not appear preachy (Rothgerber, 2014b), vegans may attempt to defy these stereotypes, and by doing so try and change the perception of vegans. Indeed, research has shown that vegans may adopt everyday life strategies such as addressing omnivores' cognitive dissonance by interrogating their conflicting beliefs rather than telling them what to think (Ophélie, 2016). People who are reducing their meat and dairy consumption could respond to meta-stereotypes about vegans by limiting their efforts to further reduce their meat and dairy intake, in an effort to decrease identification with the stereotyped group. As a second strategy, vegans could increase identification with their in-group (Leach et al., 2010; Tajfel & Turner, 1986), and more strongly identify with values and ideologies tied to veganism, such as activism, feminism, environmentalism, or animal-rights, and try to advocate vegan norms to others (Judge et al., 2022). In summary, understanding these identity processes in the context of the shift away from meat and dairy consumption could shed light into polarization between different

dietary groups (Rosenfeld, Rothgerber, & Tomiyama, 2020), and possibly help explain why the societal transition to plant-based diets is so hard to achieve. Indeed, social identity processes have been found to be a key predictor of dietary maintenance for vegetarians and vegans (Cruwys et al, 2020; Plante et al., 2019). Given that identity plays a key role in eating behaviour, we examined whether meta-stereotypes, which present a challenge to one's social identity, influence the behaviours of those reducing or eliminating meat and/or dairy from their diets.

We examined both meta-stereotypes and stereotypes of vegans, and expected that participants would hold stronger meta-stereotypes than stereotypes. Stereotypes of vegans relate to the perceptions that vegans and reducers themselves hold of vegans. The literature on social identity suggests that people derive their self-esteem from their group memberships (Tajfel & Turner, 1986). As they become increasingly aware of the stereotypes held against their group without necessarily subscribing to them (Vorauer et al., 2000), people may hold stronger meta-stereotypes as a way to enhance their group's status and differentiate it from other groups. Additionally, people's tendencies to perceive other groups as more homogeneous (Ostrom & Sedikides, 1992) and favour their own group (Tajfel et al., 1971), may lead vegans to endorse stronger meta-stereotypes than stereotypes. Therefore, we expected that vegans' and reducers' meta-stereotypes would be stronger than their own stereotypes about vegans.

Previous research has shown gender can play a significant role in people's experiences as a vegan (Branković & Budžak, 2021; Modlinska et al., 2020). For example, men may experience social influences to consume meat because of strong cultural meat-masculinity associations. Women may hold greater concerns regarding their health and sustainable choices, and may be more willing to change their dietary patterns (Ghvanidze et al., 2016). Currently, there are more women who reduce or eliminate meat and dairy foods than men (Rosenfeld & Tomiyama, 2021). We therefore focused our research on female vegans (Study 1) and female reducers (Study 2) to understand these mechanisms without getting into complexities that considering both genders might introduce. Moreover, despite consumption of seafood and eggs being unsustainable, we only

focus on meat and dairy reduction because these foods have the highest greenhouse gas emissions across the supply chain (Poore & Nemecek, 2018). In sum, we examined whether female vegans and female reducers hold vegan stereotypes and meta-stereotypes, and how this relates to their vegan identity and the motivation to keep eliminating all animal-based foods (vegans) or to keep reducing meat and/or dairy foods (reducers) from their diets.

3.3 Study 1

In Study 1, we examined whether vegans hold stereotypes and meta-stereotypes about their own dietary group. Although people may be aware of stereotypes, their beliefs may not necessarily correspond with them (Devine, 1989). Therefore, it is essential to examine both. We hypothesised that vegans would hold both stereotypes and meta-stereotypes, but that meta-stereotypes would be stronger than stereotypes (H1). Moreover, we examined how meta-stereotypes relate to vegans' identity. Assuming that a heightened sense of being stereotyped by others might make one identify more with one's ingroup, we hypothesised that meta-stereotypes correlate positively with vegan identity (H2).

We also examined how meta-stereotypes relate to vegans' regard of omnivores. Outgroup prejudice may lead an individual to evaluate an outgroup more negatively than they would members of their ingroup, aligning with social identity theory (Ashforth & Mael, 1989). As most vegans view eating meat and dairy as unethical (Ruby, 2012), they may have negative views of those who consume animal foods, hold strong negative emotional reactions to omnivores, and stereotype them as immoral (Inbar & Pizarro, 2014). In addition, when vegans feel stereotyped by omnivores, this may strengthen their negative view of omnivores (Rosenfeld & Burrow, 2017; see Vorauer et al., 2000). Therefore, we hypothesised that vegans' meta-stereotypes would be negatively correlated with outgroup regard (H3).

In addition, Study 1 was designed to provide a first exploration of associations of meta-stereotypes with vegans' motivation for dietary maintenance and with vegan self-esteem (Bagci & Olgun, 2019), as the degree to which vegans feel positive about being vegan may affect their dietary behaviours.

3.3.1 Methods

The preregistration (including study design, planned sample size, inclusion/exclusion criteria, and analyses) is available here: https://osf.io/jzfrk/and all study materials are available here: https://osf.io/5ercp/). The study received ethical approval from University of Glasgow Research Ethics Committee.

3.3.1.1 Participants and Sample Description

We ran multiple power analyses based on a paired-sample t-test for Hypothesis 1 with d = 0.2, as well as a correlation analysis for Hypothesis 2 and 3 with r = .3. No previous literature has examined meta-stereotyping in vegans. Consequently, we used the literature on meta-stereotypes in other domains (Gordijn et al., 2017; Hinton et al., 2019) to establish the smallest estimated effect size from previous research, and set that at d = 0.2. We based recruitment on the analysis that required the larger sample size (H1). Using pwr package in R (Champely et al., 2017) to achieve 80% statistical power, a significance level of 5%, and an effect size of .2, we found that the required sample size was n = 198. Therefore, we aimed to recruit 200 participants. To access the R Markdown (Rmd) files for the power analysis, see OSF.

Participants were recruited through the online research platform Prolific (prolific.co). Inclusion criteria were female gender, identifying as vegan, living in the UK, above 18 years of age, and fluent in English. The sample comprised 200 participants (Mage = 33.77 years, SD = 10.9). Most participants had been vegan for more than two years (78.5%) and were vegan due to animal rights reasons (72%), as opposed to health or environmental reasons.

3.3.1.2 Procedure

We publicised our study entitled 'Investigating vegans' perception of their dietary group' on Prolific, making it only visible to a pre-screened pool of participants who satisfied our inclusion criteria. Participants read the study information sheet, confirmed their eligibility, and provided informed consent. Participants completed the study on Qualtrics (average duration 6 min; payment £14.53/hr pro rata), were then fully debriefed, and redirected to Prolific for

payment. We report all manipulations, measures and exclusions in these studies. The order of presenting measures of stereotypes and meta-stereotypes was counterbalanced. The remaining measures were presented as listed in the order shown below.

3.3.1.3 Measures

We first asked about participants' age, primary motives for being vegan, and how long they had been vegan (less than a year, 1-2 years, 2 - 3 years, 3 - 5 years, more than 5 years). Responses to all subsequent measures were gathered on a 7-point Likert-type scale from strongly disagree (1) to strongly agree (7). For the comprehensive list of items for each measure, see OSF.

Meta-Stereotypes. We used 14 meta-stereotype items adapted from Gordijn et al., (2017), of which seven were positive and seven negative (e.g., "I think omnivores view vegans positively/negatively"; "I think omnivores view vegans as "moral", "sociable", "committed", "empathetic", "free-minded", "caring"; "extremist", "judgmental", "unhealthy", "preachy", "self-righteous", "obsessed"). Higher scores indicated stronger meta-stereotypes. Similar to Gordijn et al., (2017), we found a low Cronbach's alpha for the overall meta-stereotype measures (α = .54) because the scale contained both positively and negatively valanced items. However, Cronbach's alpha for the positive (*a* = .85) and negative (*a* = .87) meta-stereotype measures separately was high.

Stereotypes. Adapted from Gordijn et al., (2017), we used 12 stereotype items employing the same stereotypic traits and procedure to calculate subscale alpha used for meta-stereotypes, of which six were positive (*a* = .86) and six were negative (*a* = .86) stereotype items (e.g., "I think vegans are moral"; "I think vegans are extremists"). Higher scores indicated stronger stereotypes.

Vegan Identity. We assessed vegans' social identity by using five items from the identity centrality subscale (Rosenfeld & Burrow, 2018; e.g., "being vegan is an important part of who I am"; α = .91). Higher scores indicated a stronger vegan identity.

Outgroup Regard. We used five items from the outgroup regard subscale of the Dietary Identity Questionnaire (Rosenfeld & Burrow, 2018; e.g., "I judge people negatively for eating foods that go against my dietary pattern"; α = .89). We reversed scores of this scale so that a higher score indicated higher outgroup regard.

Vegan Dietary Maintenance. We used the 3-item strictness subscale from the Dietary Identity Questionnaire (Rosenfeld & Burrow, 2018; e.g., "I can be flexible and sometimes eat foods that go against my dietary pattern" reverse scored (RS)). We added one item relating to meta-stereotyping influencing dietary strictness, and a prospective item measuring the intention to adhere to their current dietary patterns ("The thought of what others think of me prevents me from adhering to my diet" (RS), "I plan on maintaining my current diet for the foreseeable future"). This resulted in a 5-item scale (*α* = .81). Items were reversed such that a higher score indicated higher dietary maintenance. The distribution of the vegan dietary maintenance scores were negatively skewed, with most participants scoring very high. We therefore recoded the data as binary, with 0 for participants who did not fully maintain their dietary restrictions (scores < 7) and 1 for those who consistently maintained their diet (scores = 7).

Vegan Self-Esteem. We used five items adapted to a vegan-based collective self-esteem subscale (Plante et al., 2019; e.g., "I feel good about being a vegan"; α = .64). Higher scores indicated higher vegan self-esteem.

3.3.1.4 Analysis

We conducted all analyses in R version 4.0.5 (R Core Team, 2021) and RStudio (RStudio Team, 2021). In addition to our preregistered t-tests and correlations, we also added a more robust analysis by conducting linear mixed effect models for each H1, H2, and H3, which allowed us to include random effects, specifically, random intercepts for participants and measurement items, as we have only included five item traits from a pool of vegan stereotype traits. Considering vegan stereotype traits as random intercept could account for the variability in stereotypic traits among different vegans (Barr et al., 2013).

Further details on the data, Rmd files, and full list of R packages are available on the OSF.

For Hypothesis 1, we compared the average scores of meta-stereotype and stereotype to the midpoint of the scale (M = 4.0) with a one sample t-test, and then used a paired t-test to compare the average scores of stereotypes and meta-stereotypes (Kim, 2015). We also fitted a linear mixed effect model to predict meta-stereotype score on the basis of stereotype category (stereotype versus meta-stereotype), using the lme4 (Bates et al., 2014) and lmerTest (Kuznetsova et al., 2017) packages.

For Hypothesis 2, Spearman's rho correlations were computed to test the linear association between meta-stereotyping and vegan identity, with higher scores of vegan identity indicating stronger vegan identity. We used Spearman's rho as distribution of variables were non-normal. We then conducted further analysis predicting meta-stereotype scores from identity scores, using a linear mixed effect model.

For Hypothesis 3, we used Spearman's rho correlations to test the association between meta-stereotyping and outgroup regard scores. We then fitted linear mixed effects models, to predict meta-stereotype scores from outgroup regard scores.

For each analysis, we also conducted exploratory analyses to investigate the role of stereotype valence (i.e., positive vs. negative (meta)stereotypes). We also conducted a final exploratory analysis on vegans maintaining their diet using logistic regression analysis, as dietary maintenance scores were skewed (with 46 % of participants fully maintaining their vegan diet). We explored whether stereotype valence, meta-stereotype valence, outgroup regard, vegan identity, or vegan self-esteem was the strongest predictor of vegan dietary maintenance, controlling for how long participants had been vegan, with 5 levels and with Level 5 ("more than 5 years") serving as the baseline comparison. We controlled for the length at which participants were vegan because 63% of participants have been vegan for more than three years. For our model selection method, the aim was to explore the relationship between meta-stereotype measures and dietary maintenance, rather than best explaining variance in our dependent

variable. Therefore, we included the critical variables to consider, vegan identity, vegan self-esteem, and positive and negative (meta-) stereotypes. We allowed all variables to be entered to predict vegan dietary maintenance independent of the univariate relationships with vegan dietary maintenance (see Smith, 2018). The order of insertion of the variables in the model followed our theoretical understanding of strongest motivational predictors of maintenance, with strongest predictors were added in the following order: vegan identity, vegan self-esteem, negative stereotypes, positive stereotypes, negative meta-stereotypes, positive meta-stereotypes, and reduction duration.

3.3.2 Results

3.3.2.1 Descriptive Statistics

Means, standard deviations, and correlations between key study variables are reported in Table 13.

Table 13 – Means, standard deviations, and correlations of the key Study 1 variables

	M	*SD*	1	2	3	4	5	6	7	8	9
1. Meta-Stereotypes	4.75	0.47									
2. Stereotypes	4.35	0.61	.36**								
3. Dietary maintenance	6.24	1.00	-.09	-.22**							
4. Vegan Identity	5.32	1.27	.23**	.13	.43**						
5. Outgroup Regard	4.86	1.62	-.07	-.06	-.20**	-.37**					
6. Vegan Self-Esteem	5.47	0.41	.10	-.06	.30**	.25**	-.00				
7. Positive Meta-Stereotypes	4.09	0.91	.51**	.13**	-.02	.11	.08	.16*			
8. Positive Stereotypes	5.88	0.73	.35**	.47**	.14*	.50**	-.17*	.25**	.20**		
9. Negative Meta-Stereotypes	5.41	0.91	.50**	.23**	-.04	.17*	-.18**	-.03	-.44**	.23**	
10. Negative Stereotypes	2.82	1.07	.14*	.79**	-.34**	-.18*	.04	-.24**	.02	-.13	.08

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. Scale ranges for all variables were from 1 to 7. * indicates $p < .05$. ** indicates $p < .01$. Correlations between all variables were calculated using Spearman's rho due to the non-normally distributed data

.

3.3.2.2 Confirmatory Analysis

H1: Stereotypes and Meta-stereotypes

In line with our predictions, results revealed that vegans held both stereotypes and meta-stereotypes, and that meta-stereotypes were stronger. Vegans reported significantly higher stereotypes than the midpoint of the scale $t(199) = 8.11$, $p < .001$, 95% $CI = [4.26, 4.43]$, $d = 0.57$. Vegans also reported significantly higher meta-stereotypes than the midpoint of the scale, $t(199) = 22.66$, $p < .001$, 95% $CI = [4.68, 4.81]$, $d = 1.60$. Additionally, results revealed that meta-stereotypes were stronger than stereotypes, $t(199) = 9.19$, $p < .001$, $CI = [0.31, 0.49]$, $d = 0.73$ (see Figure 1). The same result was obtained using linear multilevel modelling (Table 14, Model 1).

Figure 1 - Density curve for the average meta-stereotype and stereotype scores

Note. This figure illustrates the distribution of average meta-stereotype and stereotype scores. We included descriptive statistics, such as median (line within the boxplot) and mean (dot within the boxplot). The horizontal line (y= 4) represents the midpoint of the scale.

Table 14- Overview of the linear multilevel models for our three hypotheses (N = 200).

Model						
	Estimate	*SE*	*t*	*p*	Variance explained	
					R^2m	R^2c
Model 1: H1 (meta-stereotype & stereotype score)					0.280	0.859
(intercept)	5.409	0.229	23.60	**< .001**		
Stereotype category						
Stereotypes (1)	-2.591	0.318	- 8.15	**< .001**		
Meta-stereotypes (0)	----	----	----	**----**		
Model 2: H2 (meta-stereotype score)					0.0002	0.413
(intercept)	5.392	0.620	20.58	**< .001**		
Vegan identity	0.002	0.013	0.17	.867		
Model 3: H3 (meta-stereotype score)					0.0001	0.459
(intercept)	4.785	0.264	18.15	**< .001**		
Outgroup regard	-0.008	0.011	- 0.78	.454		

Note. Model 1, 2, 3 for our H1, H2, H3 accounting for random effects (subject and stereotypic traits). We've allowed model 1 to vary across stereotype category. *R2m* reports the goodness of fit of the model with just fixed effects, while *R2c* reports the goodness of fit of the full model.

H2: The Association between meta-stereotypes and vegan identity

In line with our prediction, the pre-registered analysis using Spearman's correlation suggested that meta-stereotypes were positively associated with vegan identity, $r(\mathbf{199}) = 0.23$, $p = .001$. However, multilevel modelling revealed no significant association between vegan identity and meta-stereotypes (Model 2: $b = 0.02$, $p = .867$; Table 14).

H3: The Association between meta-stereotypes and outgroup regard

Contrary to our prediction, Spearman's rho correlations revealed no significant relationship between meta-stereotypes and outgroup regard, $r(199) = -0.07$, $p = .354$. A similar result was obtained in multilevel modelling (Model 3: $b = -0.008$, $p = .454$; Table 14).

3.3.2.3 Exploratory Analyses

Valence and H1

We explored whether meta-stereotypes and stereotypes depended on stereotype valence. Indeed, negative stereotypes scores were significantly lower than positive stereotype scores *b* = -3.06, *SE* = 0.28, *p* < .001, *d* = 0.47, *d* = 0.91). Conversely, multilevel modelling negative meta-stereotypes scores were significantly higher than positive meta-stereotype scores revealed *b* = 1.32, *SE* = 0.39, *p* = .005, *d* = 0.47; see Figure 2). This suggests that vegans stereotyped their ingroup strongly positively, but believed that omnivores held strongly negative stereotypes about them.

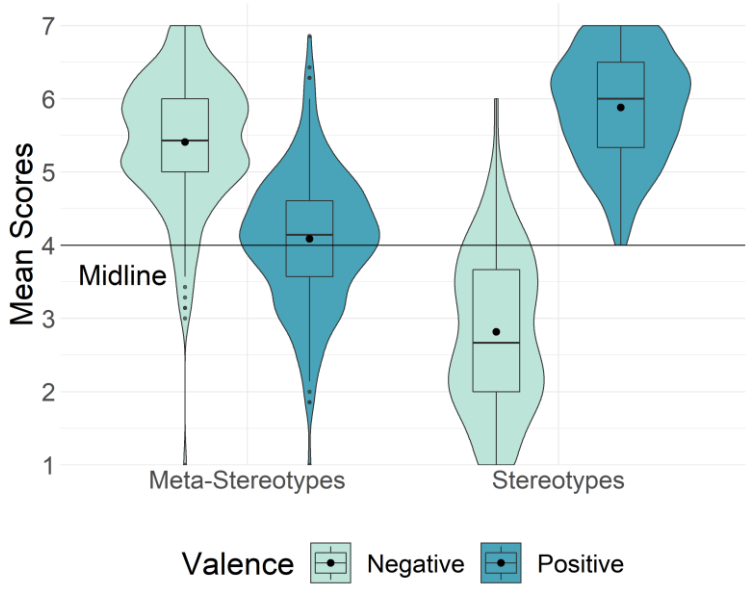

Figure 2 - Density curve for distribution of the average stereotype and meta-stereotype scores.

Note. This figure illustrates the density curve for distribution of the average stereotype and meta-stereotype scores. We included descriptive statistics, such as median (line within the boxplot) and mean (dot within the boxplot). The horizontal line (y= 4) represents the midpoint of the scale.

Valence and H2.

Exploratory analyses did not reveal associations of vegan identity with either positive *b* = 0.10, *t*(198) = 1.42, *SE* = 0.05, *p* = .16, or negative meta-stereotype scores , *b* = 0.07, *t*(198) = 1.42, *SE* = 0.05, *p* = .04. Consistent with previous results, multilevel modelling revealed no association between vegan identity and

positive meta-stereotypes *b* = 0.01, *SE* = 0.01, *p* = .618, *d* = 0.00, neither with negative meta-stereotype scores , *b* = 0.00, *SE* = 0.01, *p* = .71, *d* = 0.00.

Valence and H3

We explored if valence moderated the association between meta-stereotype and outgroup regard. Results from multilevel modelling revealed no significant relationship between outgroup regard and negative meta-stereotype scores, *b* = - 0.00, *t*(5834) = -0.78, *SE* = 0.01, *p* = .436, neither with positive meta-stereotypes, *b* = 0.00, *t*(5662) = 0.37, *SE* = 0.01, *p* = .709. This suggests that vegans' belief of what omnivores think of them was not linked to their regard for omnivores.

Vegan Dietary Maintenance

We explored the strongest predictor of vegan dietary maintenance, controlling for vegan duration (see Table 15). A total of 66 participants did not adhere to their vegan diet (0), while a total of 134 of participants fully maintained their vegan diet (1). Results revealed that the odds of maintaining dietary changes were highest for vegans with strong esteem and sense of vegan identity, *OR* = 2.62 (*b* = 0.96) and *OR* = 1.97 (*b* = 0.68) respectively. Negative stereotypes had a negative association with dietary maintenance *OR* = 0.60 (*b* = - 0.52), but no association with meta-stereotypes was found.

Table 15 - Exploring predictors of vegan dietary maintenance (binary variable)

	coefficients			
Predictor	***b***	***SE***	***p***	**Odds-Ratios (*OR*)**
Vegan self-esteem	0.96	0.47	**.039**	2.62
Vegan identity	0.68	0.17	**< .001**	1.97
Negative stereotypes	- 0.52	0.18	**.004**	0.60
Positive stereotypes	- 0.30	0.29	.296	0.74
Negative meta-stereotypes	- 0.17	0.26	.520	0.85
Positive meta-stereotypes	- 0.32	0.25	.203	0.73
Less than a year (Level 1)	- 0.94	0.69	.170	0.39
Between 1 and 2 years (Level 2)	- 1.27	0.53	**.017**	0.28

Between 2 to 3 years (Level 3)	- 0.19	0.57	.733	0.82
between 3 to 5 years (Level 4)	0.21	0.47	.655	1.23

Note. The variables included in the model follow this order: vegan identity, vegan self-esteem, negative stereotypes, positive stereotypes, negative meta-stereotypes, positive meta-stereotypes, reduction duration. The order of the variables displayed in the table is represented in decreasing order of likelihood to maintain a vegan diet. The outcome measure "dietary maintenance" is coded as 0 (flexible dietary pattern) vs. 1 (strictly maintaining a vegan diet). Length at which participants have been vegan as a covariate. We set participants who have been reducing for more than five years (Level 5) as the baseline, with the highest frequency of participants in that level. We controlled for the length at which participants followed a vegan diet. Results reveal a strong and significant effects for only Level 1 and Level 2. We report Odds Ratios (*OR*) to understand the effect of our continuous predictors.

3.3.3 Discussion

This study was designed to examine vegans' stereotypes and meta-stereotypes, and the association of meta-stereotypes with vegan identity, outgroup regard, and dietary patterns.

We found consistent evidence that vegans held both stereotypes and meta-stereotypes, and as predicted, meta-stereotypes were stronger. Vegans perceived strong negative stereotypes held against their group, but did not hold these negative stereotypes themselves. Vegans did feel that omnivores also held positive stereotypes about them, but their own positive stereotypes about their ingroup were stronger. We found no reliable association between vegan identity and meta-stereotypes, and neither between outgroup regard and meta-stereotypes.

Finally, exploratory analyses showed that vegans' group esteem and sense of identity predicted vegan dietary maintenance. In addition, vegan's negative stereotypes about their ingroup had a significant association with vegan dietary maintenance, while meta-stereotypes did not. Although no causal relationships can be inferred from these cross-sectional, exploratory findings, this suggests that negatively stereotyping their ingroup may hinder vegans' dietary maintenance, rather than the meta-stereotypes they hold.

3.4 Study 2

Study 2 was designed to examine vegan stereotypes and meta-stereotypes among a different group, namely reducers. As reducers change their dietary pattern, being exposed to vegan stigma could potentially act as a barrier to reducing their meat and/or dairy intake (Markowski & Roxburgh, 2019). In addition, as people increasingly realise the negative environmental and health impact of consuming meat and dairy, the motivation to reduce the intake of these foods may increase significantly. Hence, understanding reducers' perceptions and behaviours is important to support the needed transitions towards more plant-based diets.

Meta-stereotypes may play a role in reducers' experiences of reducing the consumption of these foods. In contrast to vegans' well defined social identities that may encourage maintenance of diets, reducers have a less well-defined identity and a more flexible dietary pattern (Rosenfeld, Rothgerber, & Tomiyama, 2020; Wehbe et al., 2022). We suggest that without a strong social identity to fall back on, the fear of being viewed negatively by others may hinder reducers in their reduction process. Reducers may then be more prone to influences from meta-stereotypes, as they may be concerned about identifying with vegans, and anticipate stigma and social rejection (Markowski & Roxburgh, 2019). Indeed, Wehbe et al. (2022) found that many reducers who still identified as omnivores worried about how they were being perceived by others in relation to stereotypes held against vegans (e.g., "*I don't want to be seen as preachy and self-righteous*" or *"I don't want to be identified as a vegan"*). Could it be that meta-stereotypes impact people's motivation and commitment to reduce the intake of meat and dairy foods?

Reducers may be aware of mainstream perceptions of vegans and hence, we hypothesised that reducers think omnivores negatively stereotype vegans (H1; negative meta-stereotypes). We also investigated how reducers relate to vegans, and hypothesised that a stronger sense of closeness to vegans would be associated with weaker negative stereotypes about vegans (H2a), and with stronger positive stereotypes (H2b), which would reflect that reducers who feel close to vegans view them in positive terms.

Little is known about how reducers' diets develop, and what influences the degree to which they maintain a reduced intake of meat and dairy. Understanding the role of meta-stereotypes in transitioning to consuming less meat and/or dairy foods may contribute to addressing this knowledge gap. Here, we examined the association of meta-stereotypes with measures of dietary change maintenance, intentions to reduce the intake of meat and dairy foods, and consumption expectations across various social situations. Measures of behavioural expectations allow us to capture people's predictions of how they would behave in different contexts and situations, resulting in a measure that is more nuanced than the general intention to reduce intake across situations averaged together (Dutriaux et al., 2021). For example, social situations, such as eating with others who consume meat and dairy foods, may motivate different dietary behaviours (e.g., fitting in) than cooking a meal at home (see Rosenfeld & Tomiyama, 2019; Wehbe et al., 2022). In sum, we hypothesised that negative meta-stereotypes would be associated with lower dietary change maintenance (H3a), with lower intentions to reduce meat and dairy intake (H3b), and with higher expected consumption of meat and dairy across situations (H3c).

3.4.1 Methods

The preregistration and all study materials are available on the OSF (https://osf.io/5ercp/). The study received ethical approval from University of Glasgow Research Ethics Committee.

3.4.1.1 Participants and Sample Description

We ran multiple power analyses based on a t-test for Hypothesis 1, with d = 0.2 (similar to Study 1), as well as a data simulation using mixed effect models for H2a, and a regression model for H3a. We based recruitment on the analysis that required the larger sample size (H3) assuming 80% statistical power, a significance level of 1.7%, correcting for testing of six hypotheses. The necessary sample size was 260. To account for potential exclusions, we planned to recruit 5% extra, leading to N = 273. To access the R Markdown (Rmd) files for the power analysis, see OSF.

Participants were recruited through the online research platform Prolific (prolific.co). We included female meat and dairy reducers who are not vegan, lived in the UK, and were at least18 years of age and fluent in English. Responses from 282 participants were recorded. We excluded a total of 10 responses (3.6% of the total sample): nine participants who reported not meeting the inclusion criteria and one participant whose submission time was implausibly short (< 300 seconds). The final sample comprised 272 participants (M_{age} = 42.00 years, SD_{age} = 12.59, M_{time} = 18.8 min).

3.4.1.2 Procedure

We advertised our study 'What people think of vegans' on Prolific and presented it in Qualtrics. After providing informed consent, participants were asked about their motives for reducing meat and dairy intake, which dietary category they belonged to, how long they had been reducing, and demographic questions, such as age, ethnic background, employment, education, and SES. They then completed the main survey. Finally, participants were fully debriefed and redirected to Prolific for payment.

3.4.1.3 Measures

Responses to all items were gathered on a sliding scale from Strongly disagree (0) to Strongly agree (100), except for Reduction Intentions and Sense of Closeness measures, and except for the open-ended questions detailed below. Situated consumption expectations were measured on a sliding scale from Never (0) to Always (100). See OSF to access the comprehensive list of items for each measure.

Meta-Stereotypes. We used the same items as in Study 1. We calculated Cronbach's alpha for the seven positive (α = .75) and seven negative (α = .91) meta-stereotype measures separately. Higher scores represented stronger meta-stereotypes.

Stereotypes. We used the same items as in Study 1, with two additional items referring to general views that reducers hold of vegans (e.g., "I have a positive/negative view of vegans"). We calculated Cronbach's alpha for the

seven positive (α = .76) and seven negative (α = .82) stereotype measures separately. Higher scores represented stronger stereotypes.

Dietary Change Maintenance. We used the strictness subscale (3 items) from the Dietary Identity Questionnaire by Rosenfeld and Burrows, (2018) (e.g., "I can be flexible and sometimes eat foods that go against my dietary pattern") and added one item ("The thought of what others think of me prevents me from adhering to my diet"). This resulted in a 4-item scale (α = .74). All items were recoded, so that higher scores represented stronger dietary change maintenance.

Situated Consumption Expectations. We constructed a novel measure to assess how frequently participants expected to consume meat and/or dairy in the next month in 10 specific situations. We asked "Now think about the coming month. Although you are currently trying to reduce your meat/dairy consumption, how often do you think you will consume meat (and/or dairy) in the following situations?" (when cooking at home, when cooking for others (e.g., your family) at home, on weekends, when visiting friends' homes, when visiting family's homes, on special occasions (e.g., parties, celebrations, ...), when others cook for you, when eating out at restaurants, when getting take-out or ordering in, when traveling; selected based on Wehbe et al., (2022). Participants answered these questions with regard to meat and/or dairy, depending on what they indicated they were reducing at the moment. Reliability was high for both meat (α = .94) and dairy (α = .92).

Sense of Closeness to Vegans. This was adapted from Aron, Aron, & Smollan, (1992) and included nine circle pairs, from not touching to completely overlapping. One circle in each pair was labelled "self", the second circle was labelled "vegan", and the distance reflected how close participants perceived themselves to be to vegans as a social group. Participants chose one out of nine responses to indicate how they related to the group of vegans, ranging from no sense of closeness (1) to full sense of closeness (9).

Reduction Intentions. We constructed a novel measure of participants' intentions to either reduce, increase, or maintain their meat and/or dairy intake within the next year. As a response to the question 'Within the next year, you

intend to', participants chose one out of six responses 'Completely cut out meat/dairy from your diet (e.g., reducing 100% of your meat/dairy intake; scored as 1)', 'Largely reduce your meat/dairy intake (e.g., reducing more than 50% of your meat/dairy intake; scored as 2)' , 'Slightly reduce your meat/dairy intake (e.g., reducing between 10% to 20% of your meat/dairy intake; 3)', or 'Keep your meat/dairy consumption levels the same (e.g., not further reducing and happy with the current levels of intake; 4)', 'Slightly increase your meat/dairy intake (e.g., increasing between 10% to 20% of your meat/dairy intake; 5)', and 'Largely increase your dairy intake (e.g., increasing more than 50% of your meat/dairy intake; 6)'. Again, participants answered these questions for meat and/or dairy, as above.

Open-ended questions. For a qualitative exploration of participants' views on challenges to reducing meat and dairy consumption, we included six open questions, asking them to list and describe the biggest barriers to meat and/or dairy consumption, to describe how other people's opinions of vegans may impact those wishing to reduce meat and/or dairy consumption, and how they thought their friends/family who eat meat perceive vegans and how they felt feel about these perceptions. Findings from these open-ended questions will be reported in a separate manuscript.

3.4.1.4 Analysis

We conducted all analysis in R version 4.0.5 (R Core Team, 2021) and RStudio (RStudio Team, 2021). The data, code, and detailed analysis documents are available on the OSF. We conducted maximal testing for the mixed effect models (Barr et al., 2013). See full list of packages on OSF.

For H1, we compared the average scores of negative meta-stereotypes to the midpoint of the scale (M = 50) with a one sample t-test. For H2a and H2b, we conducted mixed effect models with negative stereotypes scores and positive stereotypes scores as DVs, respectively, to predict stereotype scores from vegan closeness, including participants and stereotypic traits as random intercepts.

For H3, we conducted a fixed effect regression analysis to investigate the predictive power of negative meta-stereotypes on dietary change maintenance

(H3a), while controlling for the length at which participants had been reducing the foods of interest. This deviates from our pre-registered plan to run mixed effect models, as fixed effects were better fit models to test our H3a hypothesis. If participants have been reducing both their meat and dairy intake, we then averaged both their inputs on the length of reduction for meat and for dairy. Similar Study 1, we recoded the length of time at which participants have been following their dietary pattern variable to scores from 1 to 5, with level 1 set as baseline for comparison.

We also fitted two fixed effect cumulative link models (H3b) to assess the predictive power of negative meta-stereotypes on intention to reduce, one for meat reduction and one for dairy reduction. If participants were reducing both, we included their response in both analyses. This deviates from our pre-registered plan to run mixed effect models, as fixed effects were better fit models to test our H3b hypothesis. We used cumulative link models since our dependent variable was ordinal.

We also conducted two mixed effect models (H3c) to investigate the predictive power of negative meta-stereotypes on consumption expectations across 10 situations for meat reducers and for dairy reducers, while including participants and situations as random intercepts and including the length at which participants have been following their dietary pattern as a covariate.

We conducted exploratory analysis to investigate our hypotheses across stereotype valence (applied to positive and negative stereotypes separately).

Across our confirmatory analyses, we corrected for multiple testing by adjusting alpha levels to .00625 to account for testing eight hypotheses. This deviates from our pre-registered plan to correct for six hypothesis tests but accounts for running two separate models for each of H3b and H3c to test effects on meat and dairy reduction separately.

3.4.2 Results

3.4.2.1 Descriptive Statistics

Means, standard deviations, and correlations of key study variables are be reported below (see Table 16).

Table 16 –Table of means, standard deviations, and correlations of the key Study 2 variables

	M	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
1 Meta-Stereotypes	60.04	9.42													
2 Negative Meta-Stereotypes	61.88	18.83	0.66***												
3 Positive Meta-Stereotypes	58.2	14.25	0.01	-0.42***											
4 Stereotypes	56.81	9.94	0.40***	0.35***	-0.05										
5 Positive Stereotypes	69.77	14.79	0.27**	-0.10	0.54***	0.07									
6 Negative Stereotypes	43.85	23.5	0.39***	0.56***	-0.22**	0.79***	-0.60***								
7 Dietary Change Maintenance	64.21	19.34	-0.15	-0.04	-0.08	-0.18*	0.21*	-0.29***							
8 Sense of Closeness	3.41	1.87	0.14	-0.21*	0.21*	0.27*	-0.48***	-0.24***	0.04						
9 Meat Consumption Expectations	50.04	24.09	-0.03	0.05	0.01	0.16	-0.24**	0.28**	-0.43**	-0.36***					
10 Dairy Consumption Expectations	48.32	21.97	-0.00	0.02	-0.07	0.06	-0.14*	0.11*	-0.41***	-0.08	0.48***				

11 Meat Duration of Reduction	2.3	1.4	-0.05	-0.02	-0.03	-0.30	0.06	-0.14	0.17	0.13	-0.30***	-0.03			
12 Dairy Duration of Reduction	2.14	1.29	0.11	0.05	0.03	0.04	0.05	-0.01	0.11	0.12	-0.15	-0.02	0.68***		
13 Dairy Reduction intentions (1-6)	2.67	0.85	-0.12	0.04	0.17*	0.08	-0.21*	0.19**	-0.03	-0.20*	0.28**	0.25**	0.05	-0.03	
14 Meat Reduction Intentions (1-6)	2.79	0.85	-0.05	-0.06	-0.03	0.02	-0.20*	0.13	-0.01	-0.09	0.30***	0.1	0.01	-0.04	0.51***

Note. Scale ranges on a continuous scale from 0 to 100, except for reduction intentions for meat and dairy (which are options chosen out of six responses) and sense of closeness (which are options chosen out of seven responses). M and SD are used to represent mean and standard deviation, respectively. * indicates $p < .05$. ** indicates $p < .01$. Correlation used spearman-method with listwise-deletion. Meat Duration of Reduction relates to the length at which participants have been reducing their meat consumption. Dairy Duration of Reduction relates to the length at which participants have been reducing their dairy consumption.

3.4.2.2 Confirmatory Analysis

H1: Negative Meta-Stereotypes

In line with our predictions, reducers held negative meta-stereotypes about vegans (see Figure 3. Reducers reported significantly higher scores for negative meta-stereotypes (M = 61.88, SD = 18.83) than the midpoint of the scale, $t(271) = 10.41$, $p < .001$, CI = [59.63, 64.13], d = 0.63.

Density curve for distribution of average stereotype valence and meta-stereotype valence scores

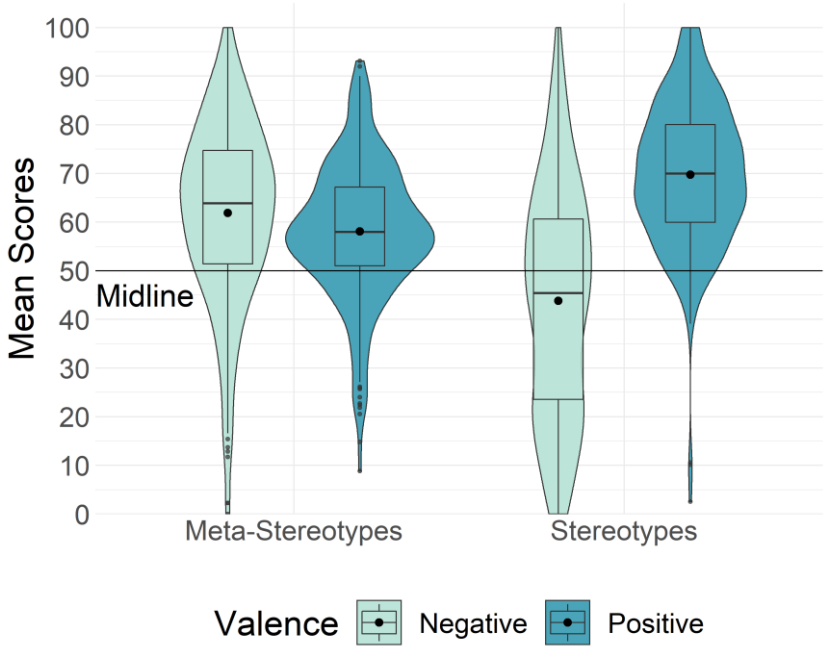

Figure 3 - Density curve for distribution of the average stereotype and meta-stereotype scores.

Note. This figure illustrates the distribution of average stereotype valence and meta-stereotype valence scores. We included descriptive statistics, such as median (line within the boxplot) and mean (dot within the boxplot). The horizontal line (y= 50) represents the midpoint of the scale.

H2: Stereotype Valence Association with Sense of Closeness to Vegans

In line with our predictions, reducers' sense of closeness to vegans predicted weaker negative stereotypes about vegans, (H2a), and stronger positive stereotypes about vegans, (H2b), see Table 17.

Table 17 - Overview of the linear multilevel models for H2a and H2b (N = 272).

Model						
	Estimate	*SE*	*t*	*p*	Variance explained	
					R^2m	R^2c
Model 1: H2a, negative stereotypes					0.151	0.721
(intercept)	64.58	4.55	14.189	**< .001**		
Sense of Closeness	-6.09	0.67	-9.118	**< .001**		
Model 2: H2b, positive stereotypes					0.096	0.579
(intercept)	58.51	2.82	20.724	**< .001**		
Sense of Closeness	3.31	0.44	7.579	**< .001**		

Note. Model 1 and 2 for our H2a and H2b, accounting for random effects (subject and stereotype traits).

H3: Association of Negative Meta-Stereotypes with Dietary Change Maintenance

We did not find support for Hypothesis H3a, b, or c. Negative meta-stereotypes had no significant association with dietary change maintenance scores, b = -0.04, SE = 0.06, p = .506, with meat reduction intentions, b = 0.01, SE = 0.007, p = .364, with dairy reduction intentions b = - 0.00, SE = 0.007, p = .655. There was also no association with meat consumption expectations across situations, b = 0.03, SE = 0.08, p = .707, or with dairy consumption expectations across situations, b = -0.02, SE = 0.08, p = .829. Meat reducers who had been reducing for longer than five years expected to consume less meat across the 10 situations. However, this was not the case for dairy reducers (see Table 18).

Table 18 - Overview of the linear multilevel models for H3c (N = 272)

Model						
	Estimate	*SE*	*t*	*p*	Variance explained	
					R^2m	R^2c
Model 1: H3c meat consumption expectations					0.105	0.624
(intercept)	52.69	5.27	9.989	**< .001**		
Negative meta-stereotypes	0.07	0.08	0.916	.36		
Between 1 and 2 years (Level 2)	-6.98	3.63	-1.92	.056		
Between 2 and 3 years (Level 3)	-2.39	4.31	-0.554	.579		
Between 3 and 4 years (Level 4)	-11.58	4.85	-285	.017		
More than 5 years (Level 5)	-30.3	4.52	-6.707	**< .001**		
Model 3: H3c dairy consumption expectations					0.006	0.619
(intercept)	49.69	5.74	8.133	**< .001**		
Negative meta-stereotypes	0.03	0.09	0.377	.707		
Between 1 and 2 years (Level 2)	0.98	4.61	0.212	.832		
Between 2 and 3 years (Level 3)	-2.38	5.2	-0.458	.648		
Between 3 and 4 years (Level 4)	-5.62	5.87	-0.958	.34		
More than 5 years (Level 5)	1.57	7.01	0.224	.823		

Note. Length at which participants have been reducing. Level 1 (less than a year) was set as a baseline, due to the highest frequency of participants in that level. Level 2 (between 1 and 2 years), Level 3 (between 2 to 3 years), Level 4 (between 3 to 5 years), and Level 5 (more than 5 years). Model for our H3c meat and dairy, with consumption expectation as our DV, accounting for random effects (subject and stereotypic traits).

A visualisation of participants' meat and dairy consumption expectations for different situations can be seen in Figure 4.

Figure 4 - Forest plots of mean consumption expectations (meat vs dairy) for each of the 10 situations

Note. This figure visualises the means of the consumption expectation for each of the 10 situations across the participants that reduce meat and those that reduce dairy. Error bars are one standard deviation in each direction around the mean, providing a measure of the variability across participants. Responses were given on a 100-point scale from 0 to 100.

3.4.2.3 Exploratory Analysis

Exploration Linked to H1

We explored whether meta-stereotypes and stereotypes depended on stereotype valence (Figure 3). Positive stereotype scores (M = 69.77, SD = 14.79), $t(270)$ = 22.05, CI = [68.01, 71.54], p < .001, d = 1.34, positive meta-stereotype scores (M = 58.20, SD = 14.25), t (271) = 9.50, CI = [56.50, 59.91], p < .001, d = 0.58, and negative meta-stereotype scores (M = 61.88, SD = 18.83), t (271) = 10.41, CI = [59.63, 64.13], p < .001, d = 0.63, were significantly above the midpoint of the scale, whereas negative stereotype scores (M = 43.85, SD = 23.50), t (271) = -4.32, CI = [41.04, 46.65], p < .001, d = 0.26, was significantly lower than the midpoint of the scale.

In general, reducers held stronger meta-stereotypes than stereotypes about vegans, $t(271)$ = 6.87, CI = [2.30, 4.15], p < .001, d = 0.33 (see Figure 5). In addition, reducers

viewed vegans more positively than they believed omnivores viewed them. Specifically, negative meta-stereotypes were significantly higher than negative stereotypes about vegans $t(271) = 15.18$, $CI = [15.70, 20.38]$, $p < .001$, $d = 0.85$, whereas positive meta-stereotypes were significantly lower than positive stereotypes about vegans $t(270) = -13.67$, $CI = [-13.23, -9.90]$, $p < .001$, $d = 0.80$ (see Figure 5).

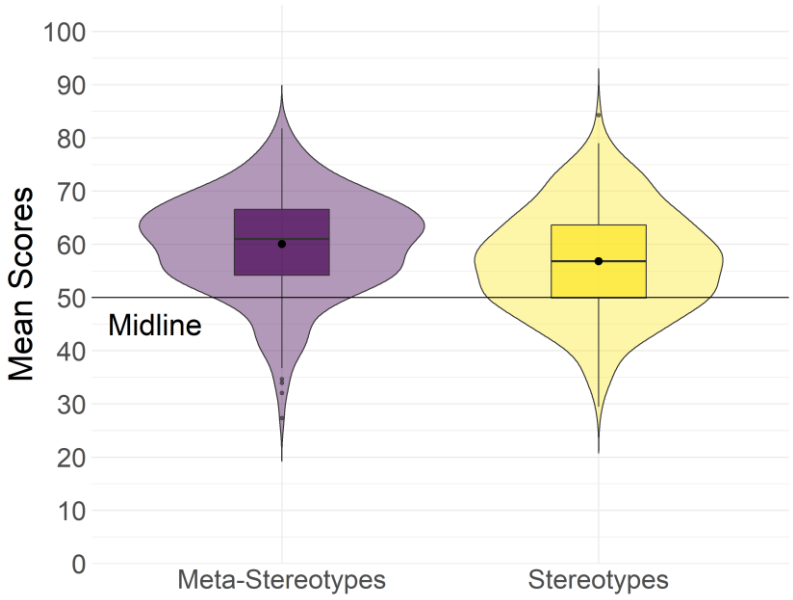

Figure 5 - Density curve for distribution of average stereotype and meta-stereotype scores

Note. This figure illustrates the distribution of average stereotype and meta-stereotype scores. We included descriptive statistics, such as median (line within the boxplot) and mean (dot within the boxplot). The horizontal line (y= 50) represents the midpoint of the scale.

Exploration Linked to H2.

We explored whether in addition to stereotypes (see H2 above), meta-stereotypes were associated with a sense of closeness to vegans. Indeed, negative meta-stereotypes predicted lower sense of closeness to vegans $b = -1.72$, $t(270) = -3.01$, $SE = 0.60$, $r = -0.13$, $p < 0.01$, and positive meta-stereotypes predicted higher sense of closeness to vegans $b = 1.40$, $t(270) = 3.09$, $SE = 0.45$, $r = 0.12$, $p < 0.01$.

3.4.3 Discussion

In line with our hypotheses and Study 1, we found that reducers held negative meta-stereotypes about vegans. However, our results did not support the predicted associations of negative meta-stereotypes with three measures of maintaining meat and/or dairy reduction. Reducers generally viewed vegans more positively than they believed that others viewed them, with stronger positive stereotypes than meta-stereotypes, and weaker negative stereotypes than meta-stereotypes. In addition, and as predicted, this pattern was associated with a stronger sense of closeness to vegans. In sum, reducers viewed vegans more positively than they believed others viewed them, but their perceptions of others' views did not translate into lower intentions to reduce their meat and/or dairy consumption.

3.5 General Discussion

This research aimed to investigate whether vegans and reducers hold stereotypes and meta-stereotypes about vegans, and how this relates to maintaining their dietary changes. We found that both vegans and reducers believed that omnivores stereotype vegans, a phenomenon we referred to as meta-stereotypes (see Vorauer et al., 2000). Negative meta-stereotypes were stronger than positive meta-stereotypes. Both vegans and reducers also stereotyped vegans themselves, with positive stereotypes being stronger than negative stereotypes, suggesting a self-enhancement effect for vegans and reducers who felt close to vegans (e.g., Alicke & Sedikides, 2009; Wills, 1981, 1991). Overall, our results showed that vegans and reducers saw vegans in a more positive light than they believed vegans were seen by omnivores.

Our results also showed links with intergroup attitudes. Vegans viewed their own group positively, and believed they are viewed by omnivores unfavourably. Contrary to our expectations, neither positive nor negative meta-stereotypes were associated with an increased sense of vegan identity. It is possible, however, that responses to feeling stereotyped would manifest as an increased sense of self-worth (see Voyles et al., 2014) in ways that were not assessed here, for example in an increased endorsement of identities or values in related areas such as feminism, environmentalism, or animal-rights, or increased motivation to advocate vegan norms to others (Judge et al., 2022). In addition, we found that reducers who held more positive views about vegans (i.e.,

stronger positive stereotypes and weaker negative stereotypes) felt closer to vegans as a group. These views might support the shift of the identity needed to successfully reduce meat and/or dairy intake in situations that are heavily oriented towards consuming animal-based foods (Carr et al., 2021; Eker et al., 2019). Together, these findings reflect polarisation between different dietary groups, such that those who are moving away from meat-based diets may have positive views of vegans but may feel that they are viewed in a negative way by omnivores.

Finally, we examined the relationship between meta-stereotypes and the motivation to maintain dietary change. For vegans, although vegan esteem and vegan identity was most strongly associated with maintaining a vegan diet, negative stereotypes, rather than negative meta-stereotypes, were associated with lower chances of fully maintaining a vegan diet. This held when controlling for the duration of following a vegan diet. In other words, even those who self-described their diet as vegans for a longer time were less likely to be strict in their diet if they stereotyped their ingroup more negatively. Stereotyping one's ingroup is perhaps a strategy to disidentify from the group and could hinder vegans in maintaining their diet. However, these findings resulted from exploratory rather than confirmatory tests, and no causality can be inferred from the cross-sectional associations. Hence, this might be valuable to examine further in confirmatory, longitudinal research.

For reducers (Study 2), we also found no evidence of the hypothesised association of negative meta-stereotypes with any of the measures of maintaining one's diet, including consumption expectations in various social and non-social situations. Previous research that suggests that pressures from social situations, for example when others react negatively to not eating meat, contribute to making choices incongruent with reduction goals (Rosenfeld & Tomiyama, 2019; Wehbe et al., 2022), yet have not directly assessed meta-stereotypes processes in this context. We have not found that meta-stereotypes play a significant role in the motivation to maintain dietary changes, perhaps, because we assessed general group perceptions, rather than the interaction with specific individuals in specific situations. Results may differ if participants were immersed in real-life social situations instead of completing a survey on a computer. However, it is also possible that stereotypes attributed to a whole group (e.g., "omnivores") have less effect on behaviour than stereotypes voiced by specific

individuals. Future research should continue to examine whether and how meta-stereotypes influence dietary behaviour, ideally with measures other than self-report.

Our research adds to the literature on meta-stereotypes by assessing these in a novel domain relevant for urgently needed societal change, namely the transition to plant-based diets. In addition, our research adds to the literature by measuring meta-stereotypes not only among the stereotyped ingroup (i.e., vegans), but also among an "adjacent" group (i.e., reducers). Strictly speaking, these are not "meta-stereotypes" in the sense that the term is usually used (Vorauer et al., 1998) but rather attributed stereotypes about a social group, observed by a third party. No previous research, to our knowledge, has examined such attributed stereotypes so far. In the context of dietary change, reducers may be influenced or inspired by vegans to various degrees, which may make vegan meta-stereotypes of interest to them. Indeed, our research showed that reducers viewed vegans very positively, with strong attribution of positive traits and relatively weak attribution of negative traits, especially if they felt closer to vegans as a group. In other words, some reducers may see vegans as "aspirational".

We had hypothesised that this potential relevance of vegans as a group might weaken reducers' resolve to follow through on meat and/or dairy reduction if they feel that vegans are being stereotyped, essentially increasing the distance to the stereotyped group (Markowski & Roxburgh, 2019). However, it is possible that this effect was not observed because reducers have a flexible identity that makes stereotypes attributed to vegans less threatening to them. Future research might attempt to examine this, for example by testing in a well-powered study whether a sense of closeness to vegans makes vegan meta-stereotypes more threatening. Moreover, Previous research on the enablers and barriers of plant-based food transitions (see Graca et al., 2019) identified a number of psychological factors that hinder individuals to transition towards plant-based diets. It would be important to find out how relevant meta-stereotypes about vegans are compared to these other factors. Future research could consider the perceived stereotypes held by people within the social network of meat reducers.

3.5.1 Theoretical Implication

Consistent with the Vegan Paradox Framework (De Groeve et al., 2021), our work evidences the socially shared stereotypes about vegans. The model highlights that

exposure to vegans can trigger stereotypic thinking about vegans, and predicts omnivores' willingness to reduce the consumption of animal products. Our findings suggests that reducers stereotype vegans negatively (e.g., extremist), and sometimes, positively (e.g., moral), yet we do not assess behavioural implications of people strongly endorsing such perceptions. Beyond what the model offers, our findings reveal meta-stereotype processes for vegans that the model does not account for. Adding meta-stereotypes processes would provide insights not only into behavioural outcomes of omnivores but of vegans as well. One could hypothesise that meta-stereotypes of vegans might play a role in the vegan paradox and could predict behavioural implications for vegan, such that vegans could behave in alignment with perceived expectations of omnivores, as the self-fulfilling prophecy would suggest (Johnson et al., 2000; Kamans et al., 2009; Matera et al., 2015; Zhang et al., 2016).

In our Study 1, we did not assess the association between meta-stereotypes with willingness neither with intentions to maintain a vegan diet, yet future studies would benefit from assessing these, using food diaries and experimental manipulations. Additionally, free association tests could provide more subtle insight with people's spontaneous responses. This could include allocating omnivores to answer questions about the different groups (e.g., omnivores, vegans, vegetarians) and assessing impressions of vegans before exposure to the stimuli. Results from such studies could expand the Vegan Paradox Framework on behavioural outcomes for vegans. By doing so, the model would encompass implication of such stereotype processes for both omnivores and vegans.

3.5.2 Applied Implications

In line with previous research (De Groeve & Rosenfeld, 2022; MacInnis & Hodson, 2017; Rothgerber, 2014a; Sanford & Lorimer, 2022), our findings suggest that the label "vegan" can activate thoughts of stereotypes that are socially shared. In the context of food choices, this may make vegan foods less appealing. Indeed, research has shown that labels that indicate 'vegan' or 'vegetarian' on menus or packaging can reduce the appeal of the food (Krpan & Houtsma, 2020). Similarly, omnivores have been found to rate the term "vegan" for foods less positively than the term "plant-based" (Papies et al., 2020). It has been suggested to use appealing language (e.g., referring to provenance, flavour, look and feel of the food) rather than the conventional vegan,

vegetarian, or meat-free labels, to encourage people to consume plant-based foods, and to avoid associations with "veganism" (Wise & Vennard, 2019). Indeed, using words that refer to enjoyable, situated eating experiences (e.g., pub-favourite, rich, soft, tasty) has been shown to increase the appeal of plant-based foods, especially for highly habitual meat eaters (Papies, Johannes, et al., 2020). Perhaps then, moving away from conventional labels and creating a rewarding expectancy of eating could invite people to explore plant-based foods away from the stereotypic associations linked to the groups who habitually consume them.

It is also possible that stereotypes, and hence perceptions of being stereotyped, could be reduced by education and improved communication around the catastrophic effects of animal agriculture on the climate and on the ecosystems that humans depend on (Clark et al., 2020; Springmann et al., 2018; Willett et al., 2019). Although a majority of people in high-income countries indicate to be concerned about climate change (Hoffmann et al., 2022), few are willing to strongly reduce their meat and/or dairy consumption in line with scientific recommendations for sustainability (Graça et al., 2019; Piazza et al., 2015; Willett et al., 2019). Indeed, not even current global dietary guidelines are in line with the needed cuts to greenhouse gas emissions (Sinclair, Combet, & Papies, 2023; Springmann et al., 2020). Perhaps, understanding the planetary health implications of current Western diets in more detail, and seeing scientific recommendations on meat reduction reflected in official guidelines, would increase people's understanding or appreciation of vegans' values and behaviours. In addition, increasing the exposure to plant-based foods, and making plant-based foods the default in food settings for example through changing public procurement policy, could make vegan plant-based more normative and hence, less prone to triggering stereotyping (see also Papies et al., 2023). This might lead to greater acceptance and to less attribution of stereotypic traits that contribute to dietary group polarisation.

3.5.3 Strengths and Limitations

First, by sampling only female participants, our research provided insights into social perceptions among the majority of meat avoiders, as the majority of vegans, vegetarians, and are women (Rosenfeld & Tomiyama, 2021). However, future research may seek to extend this work to male participants, for whom different processes could play a role (e.g., masculinity norms around meat consumption; Modlinska et al., 2020;

Ruby & Heine, 2011). Second, our research offers two robustly powered studies and an internal replication of Study 1 in a conceptually similarly study with a different sample in Study 2. This increases our confidence that our results on the experience of vegan meta-stereotypes are generalisable towards at least the female UK population with similar dietary patterns. However, we did not examine a representative sample, and people from different socioeconomic background, minority cultures, ethnicities, and less educated backgrounds are likely underrepresented in our studies. In addition to addressing this, future research on the effects of meta-stereotypes on the transition to plant-based diets should attempt to include measures of eating behaviour that do not rely on self-report, and that ideally follow up individuals undergoing dietary change over a longer time period. This way, processes of identity change could be assessed as well, and this could incorporate a novel measure of reducers' identity from a multiple identity perspective (Randers & Thøgersen, 2023).

3.6 Conclusion

This work presents robust evidence for vegan meta-stereotypes, and initial evidence that these may play a role in the polarisation around plant-based diets. Given that a radical reduction in meat and dairy consumption in high-income countries is urgently needed to maintain a liveable future for all, future research should assess how such stereotypes can be overcome and which strategies can increase the uptake of plant-based foods regardless of stereotypic associations.

4 Chapter 4: To Stand Out or to Conform: Stereotypes and Meta-Stereotypes as Barriers in the Transition to Sustainable Diets.

This is an extract of the preprint, and now under review:

Wehbe, L., Duncan, S., Banas, K., & Papies, E. K. (2023b). To stand out or to conform: Stereotypes and meta-stereotypes as barriers in the transition to sustainable diets. *PsyArXiv.*, https://doi.org/10.31234/osf.io/3a64d

All study materials and analysis are available on the Open Science Framework analysis, and can be found in the anonymised link on OSF https://osf.io/5ercp/ preregistration.

4.1 Abstract

The fear of being judged, particularly when avoiding meat and dairy foods, hinders people's motivation to adopt plant-based diets. Therefore, this study aims to explore stereotypes and meta-stereotypes in the context of individuals reducing their meat and dairy consumption, as meta-stereotypes have not been previously explored in this context. Specifically, it examines whether individuals reducing their meat and/or dairy intake believe that omnivores stereotype vegans (referred to as meta-stereotypes) exploring how these beliefs, alongside with other barriers, impact the transition towards reduced meat and/or dairy diets. Through open-ended questions in an online survey, we explored the experiences and perceived barriers among female meat and/or dairy reducers (n = 272), as well as their perceptions of vegans (i.e., stereotypes and meta-stereotypes), and how these perceptions affected their lived experiences. We analysed the data using reflexive thematic analysis and generated six themes. We highlighted perceptions of cost (Theme 1) and perceptions of health (Theme 2) concerns as the most frequently mentioned barriers to the reduction of meat and/or dairy intake. Regarding (meta) stereotypes, participants' perceptions of vegans were shaped by personal experiences and encounters with vegans (Theme 3), and how participants related to vegans sometimes reflected in the language they used to describe vegans (Theme 4). Participants felt that they, or reducers more generally, were occasionally judged as vegans (Theme 5), which might influence participants' choices and conformity to eating norms (Theme 6). Meta-stereotypes may play a role in polarized dietary group perceptions.

Keywords: Meta-stereotypes, stereotypes, reducers, vegans, behaviour change maintenance, conformity, qualitative research

4.2 Introduction

Reducing meat and/or dairy intake is essential for addressing climate change (Willett et al., 2019), but it is not yet widely socially accepted. Abundant evidence shows that meat and/or dairy reducers, refer to as 'reducers' hereafter, fear judgement for their dietary choices (Markowski & Roxburgh, 2019; Minson & Monin, 2012; Romo & Donovan-Kicken, 2012; Wehbe et al., 2022). Anticipating judgement may lead individuals to conceal identities involved in their food choices, particularly when these identities are viewed negatively by others (Bisogni et al., 2002). Meta-stereotyping, where individuals believe that outgroup members hold stereotypical views of their ingroup, may trigger concern or fear of being judged (Vorauer et al., 2009). Negatively stereotyping vegans may hinder people's willingness to reduce meat and/or dairy. Indeed, omnivores perceiving vegans as arrogant and overcommitted were unwilling to consume less animal products (De Groeve et al., 2022). Therefore, it is important to explore how reducers' stereotypes and meta-stereotypes of vegans motivate dietary changes and shape identities. In a set of studies (Wehbe et al., 2023a), we examined the role of stereotypes and meta-stereotypes in the motivation to maintain a dietary change and identities. Here, we present the qualitative analysis of participants' answers to open-ended questions, exploring how reducers' meta-stereotypes of vegans play out in their lived experiences.

In the context of our research, we define reducers as individuals trying to reduce their meat and/or dairy consumption. The term meat reducers has been used interchangeably with flexitarians (Malek & Umberger, 2021; Rosenfeld, Rothgerber, & Tomiyama, 2020). Previous research has highlighted that "flexitarian" is a term primarily used by researchers, and lay people who are reducing their meat and/or dairy consumption may still identify as vegetarians, flexitarians, or omnivores (Wehbe et al., 2022). Here, we focused on the behaviour of altering meat and/or dairy consumption, as did other researchers (Patel & Buckland, 2021). With the foundational definitions established, we now delve into the examining the challenges reducers may face when reducing their meat and/or dairy consumption.

Numerous barriers hinder the reduction of meat and/or dairy intake. These include limited awareness of the environmental impact of meat production (de

Boer et al., 2016) and the lack of knowledge and cooking skills for plant-based meals (Graça et al., 2015). Other barriers stem from motivations to consuming meat or dairy, such as familiarity and convenience (Hoek et al., 2011), motivations to preparing plant-based dishes, including difficulty, time, and cost (Lea et al., 2006b; Pohjolainen et al., 2015), and the unwillingness of a partner/ family members to consume plant-based foods (Drolet-Labelle et al., 2023; Wehbe et al., 2022). Moreover, reports from vegetarians revealed their perceptions of their rigid eating practices, that hindered socialising due to stereotypes linked to dietary choices (Buurman et al., 2022). A key barrier in many social settings are attitudes towards vegans. Indeed, stereotypes about vegans are prevalent in mainstream society, and people who choose to reduce their meat and/or dairy intake fear being stereotyped as vegans (Eakman & Metallinos-Katsaras, 2022; Markowski & Roxburgh, 2019).

Through their behaviour, vegans do not conform to normative perceptions about eating meat and dairy foods (MacInnis & Hodson, 2017; Ruby, 2012; Piazza et al., 2015). People evaluate others based on what they eat, which gives room for consumption stereotypes (Vartanian, 2015). Some of the common negative stereotypes linked to vegans include hippies and “do-gooders” (Burgess et al., 2014; MacInnis & Hodson, 2017; Rothgerber, 2020), or virtuous, extremist, unhealthy, and weak (Ruby & Heine, 2011). Such stereotypes may hinder people’s experiences of dietary transition (De Groeve et al., 2022; Rosenfeld et al., 2022). In environments where these stereotypes are salient or when intergroup interactions are anticipated, people may wonder how an outgroup views them, which can lead to the activation of meta-stereotypes (Vorauer et al., 2009).

Stereotyping and meta-stereotyping vegans may be important to examine in the dietary transition towards consuming less meat and/or dairy. As a result of vegan stereotypes, it can be difficult for reducers to disclose their diets if they anticipated negative judgments (Wehbe et al., 2022). Additionally, reducers may not want to be labelled as preachy, altering their choices due to attain a positive identity. A series of studies have found that vegetarians may elicit adverse responses from people who consume meat because they activate conflict and dissonance related to consuming meat (Rothgerber, 2014b).

However, there might be other intergroup processes that have not been assessed in this context, such as meta-stereotypes. In domains outside dietary behaviours, meta-stereotypes have been linked to attitudes, biased information processing, or even acting in line with meta-stereotypes as a self-fulfilling prophecy (Johnson et al., 2000; Kamans et al., 2009; Matera et al., 2015; Zhang et al., 2016). Whether meta-stereotypes play a role in reducing meat and/or dairy consumption remains an unexplored question. We aim to address this here.

Reducers may also experience vegan stereotypes as barriers to their dietary changes. Here, we used the social identity approach (Abrams & Hogg, 1990; Brown, 2000; Hornsey, 2008) to explain how reducers view vegans within their social context and trace the link between meta-stereotypes, dietary behaviours and social identities. The social identity approach suggests that people make sense of their social world based on group-based categories. They differentiate those who belong to their ingroup, seen as "us", from those who do not, seen as "them". A positive sense of self is built by viewing one's in-group more favourably than the outgroup. Social identity influences feelings within social contexts (e.g., attaining a sense of pride of belonging to a group) and behaviour (e.g., discrimination against out-groups). Stereotypes and meta-stereotyping can emerge as a result of such categorisation. Yet, little is known about how these stereotypes and meta-stereotypes of vegans influence reducers' lived experiences of dietary changes.

4.2.1 Existing Evidence of Meta-Stereotypes of Vegans

In our earlier work (Wehbe et al., 2023a), we examined whether vegans and reducers held stereotypes and meta-stereotypes about vegans. We also assessed whether these were associated with the motivation to maintain dietary changes and how close reducers felt to vegans. We found that vegans and reducers believed that omnivores stereotype vegans, in other words, they held meta-stereotypes. Negative meta-stereotypes were stronger than positive meta-stereotypes. Both vegans and reducers stereotyped vegans themselves, with positive stereotypes being stronger than negative stereotypes. We found that reducers who held stronger positive stereotypes and weaker negative stereotypes felt closer to vegans as a group, and those that held stronger negative stereotypes felt less close to vegans. For both vegans and reducers, we

found no evidence of an association between meta-stereotypes and the motivation to maintain a dietary change for vegans and reducers.

We integrated open-ended questions as part of Study 2, exploring the lived experiences among reducers of stereotypes and meta-stereotypes of vegans. Our findings are reported here, employing qualitative analysis for an in-depth exploration of individual experiences and perceptions to identify patterns for our comparative case study design (Braun et al., 2020). We then triangulated our findings in the light of the quantitative findings (Wehbe et al., 2023a). Triangulation of methodologies enables us to gather data from different angles and perspectives. By triangulating these methods, we cross-validated our findings, ensuring a robust and trustworthy interpretation of our research questions. While researchers have focused mostly on convergence of findings to strengthen the overall validity and reliability of research (Creswell, 1999; T. W. Lee et al., 1999), there has been little focus on divergent findings. Embracing divergent findings can help generate new insights and drive alternate explanations that challenge theories, existing assumptions on relationships, or methodological development while avoiding confirmation bias (Mcgrath, 1995; S. F. Turner et al., 2017). Therefore, we address both convergent and divergent triangulation in our discussion.

4.2.2 The Current Work

Here, we aimed to explore the major barriers to reducing meat and/or dairy intake, and, more specifically, the role of stereotypes and meta-stereotypes of vegans not among the stereotyped ingroup (i.e., vegans), but among an "adjacent" group (i.e., reducers). While this label may not precisely align with the definition of meta-stereotypes – which pertain to perceived stereotypes about one's ingroup – we will use the term "meta-stereotypes" for simplicity and consistency across our studies. Meta-stereotype falls within the classification of group meta-perception. Perceiving stereotypes between two separate groups from the group that one belongs to involves shared processes of perspective taking with meta-stereotypes. However, their implications for behaviour and identity could differ, given that meta-stereotypes involve targeted stereotypes towards one's own group, and later discussed in our discussion.

We focused solely on women, as women hold greater concerns regarding their health and the environment, and are also more willing to change their dietary patterns (Ghvanidze et al., 2016). The experience of reducing meat and/or dairy intake might be different for men, who may experience stronger expectations to consume meat because of strong cultural meat-masculinity associations. By focusing only on women, we aim to understand their experience without getting into complexities that considering both genders might introduce. We began by asking about the perceived barriers to reducing meat and/or dairy consumption, and then asked about social processes and perceptions as potential barriers. Ultimately, this may suggest pathways to support reducers in their shift to consuming less meat and dairy. In sum, we addressed the following research questions:

1) What do female reducers perceive as the biggest barriers to reducing meat and/or dairy intake? How do they experience these barriers?

2) What is the role of stereotypes and the others' perspectives about vegans (i.e., meta-stereotypes) in the process of reducing meat and/or dairy intake? How does it influence women trying to reduce their meat and/or dairy consumption?

4.3 Methods

This study received ethical approval from the University of Glasgow Research Ethics Committee. We pre-registered the work as part of our previous study (see OSF; https://osf.io/5ercp/.

4.3.1 Procedure

We asked participants three open-ended questions (see Table 19). We piloted the survey for comprehension (n = 10).

Table 19 - Main questions of the survey schedule as shown to participants

1.a. In your opinion, what are the obstacles you think people face when reducing their meat and/or dairy consumption?

1.b. From those barriers you have listed, which one do you think is the biggest barrier to people reducing the consumption of these foods, and why do you think this is the biggest barrier?

1.c. If you can, please provide detailed examples of the barrier you described in the question above from either:
a) your personal experience,
b) experiences you have observed from others, or
c) of a hypothetical situation.

2) Imagine there is a person that is trying to reduce their meat and/or dairy consumption. How do you think other peoples' opinions of vegans may impact this person? Please explain why you think this impact or lack of impact would occur.

3) How do you think your friends/family who eat meat perceive vegans? How do you feel about these perceptions?

Prior to these open-ended questions, participants were asked a series of questions listed in the order shown. First, we asked about participants' demographics (e.g., age, primary motives, and how long they had been vegan). Then, we assessed both positive and negative meta-stereotypes (e.g., "I think omnivores view vegans positively/negatively"), including specific traits (e.g., "moral", "self-righteous") and stereotypes (e.g., "I think vegans are moral", or "I think vegans are extremists"). We asked about motivations to maintain dietary changes (e.g., "I plan on maintaining my current diet for the foreseeable future"; "Within the next year, you intend to completely cut out meat/dairy from your diet (e.g., reducing 100% of your meat/dairy intake)"; "how often do you think you will consume meat (and/or dairy) when visiting family's homes?"). Finally, we asked about participants' sense of closeness to vegans. They were asked how they related to vegans, and to choose from a list of 9 options adapted from the self-other scale (Aron, Aron, & Smollan, 1992). Full details can be found on OSF. Analysis of these quantitative data can be found in Wehbe et al. (2023).

4.3.2 Participants

Participants were recruited via Prolific (prolific.co), and provided their informed consent prior to their inclusion in the study. Participants were female reducers living in the UK, at least 18 years old, fluent in English, and did not identify as vegans. Sample size was based on the number of participants required for the quantitative part of the study. The final sample was N = 272 (Mage = 42 years, SD = 12.59) and survey completion took 19 min on average. For further demographic details of our sample, see Table 20.

Table 20 - Frequency table summarising participants' demographics and dietary background (N = 272)

	Participants
Age Range	
[18 - 24]	11
[25 - 35]	64
[36 - 45]	50
[46 - 55]	81
Participants who omitted the question	66
Current Diet	
Reducing both meat and dairy	129
Reducing meat only	119
Reducing dairy only	24
Motives	
Health	139
Animal Rights	56
Environment	60
Other	17
Dietary Group	
Omnivore	133
Flexitarian	28
Pescatarian	12

Meat and/or dairy reducer	81
Vegetarian	26

4.3.3 Data Analysis

We developed thematically organised patterns throughout the dataset, supported by participants' quotes. We adopted a reflexive thematic analysis approach (Braun & Clarke, 2006, 2013, 2014, 2019) and followed the six stages of analysis using NVivo Software (Windows Version 12) as a qualitative analysis management tool (Maher et al., 2018). See Table 21 for more details on the analysis process. We found reflexive thematic analysis appropriate for this work as it underlines researchers' reflexivity, and rejects the notion that meaning is fixed within data. Aligning with this approach, we employed critical realism to uncover deeper mechanisms and contextual factors to understand experiences of reducing meat and/or dairy intake (Fletcher, 2017; Lawani, 2020). We later discuss how the data links to existing theories.

Table 21 - Thematic analysis process

Thematic analysis process based on the six phases outlined by Braun and Clarke (2006, 2013, 2019)

Phases	Process	Author involvement
Phase 1: Data familiarisation	Researchers immerse themselves in a process of familiarisation with the data by repetitively reading while taking notes of initial insights.	As part of the initial stages of coding, first and second author recurrently read through the dataset to familiarise themselves with the data.
Phase 2: Initial code generation	Researchers engage in a process of creating and assigning codes to categorise the data extracts.	First and second author separately conducted initial exploratory annotations, including descriptive comments and reflections, all while

		noting the individual cases within their demographic context. They coded initial responses separately and focused on the representativeness of recurrent patterns within the data, and meaningfulness of the differences and the deviant cases. They held discussions periodically to share and combine their reflections, identifying an initial, yet flexible thematic framework.
Phase 3: Initial themes generation	Researchers generate initial themes through a process of clustering together codes that are related within and across individual cases.	First author fed back these discussions to third and fourth authors, which allowed for in depth descriptions, diverse perspectives through these discussions, and an unbiased immersion analysis of participants' experience. The primary goal of our thematic discussions was to foster the exchange of potentially varied data interpretations, rather than aiming to achieve a consensus or assess coding reliability. Employing this method is considered valid for attaining a comprehensive shared understanding of the data when there are multiple coders involved (Byrne, 2022).
Phase 4: Reviewing and refining themes	Researchers review and refine themes through a process of validating the accurate representation of the data within the themes.	First author created hierarchical links between the codes, by exploring queries on NVivo and by integrating the discussions held with all authors.
Phase 5: Defining and naming themes	Researchers define and name themes through a process of formulating the essence of the theme.	To review and refine the themes, first author assessed the themes across the entire dataset. All authors agreed to the generated themes fitting the dataset.

Phase 6: Producing report	Researchers write the report as the final stage of the analysis. The write up of the findings and each theme in turn present an opportunity for a final refinement of the themes.	First, third, and fourth authors held discussions to link the findings to previous literature and theories. First author developed the initial draft of the manuscript. Third and fourth authors contributed to the reviewing and write-up the report.

4.3.4Credibility Strategies

We ensured credibility of the analysis through multi-angled and continual observations of the data (Korstjens & Moser, 2018), warranting transferability through comprehensive descriptions of the participants' experiences in context of their demographic setting. Apart from our methodological triangulation described above, we also used investigator triangulation in the analysis process by which both first and second author held periodic discussions after prolonged engagement with and persistent observation of the data, reflecting on the emerging patterns from the data analysis as well as integrating the deviant cases within the analysis process. Through their periodic discussions, firth and second author held a reflexive approach to research, where first author kept a reflexive diary (Langdridge, 2007). Below is an extract from the reflexive diary regarding on LW's positionality within this research, which influenced the formulation of the current work. For the full report, see OSF.

"When reflecting on my dietary journey, I often described myself as "mostly vegan, with seldom and occasional consumption of meat and dairy foods." This elicited reactions, such as health concerns, from family. Experiences of participants in Chapter 2 related to discomforting perceptions of vegans, resulting in expectations or worries about societal judgment or stigma when avoiding meat and dairy foods. This highlights the complex social dynamics involved, and piqued my interest in examining meta-stereotypes of vegans from the perspective of reducers, a construct not previously explored in the dietary context. Both personal and academic inquiry about meta-stereotypes laid the groundwork for Chapters 4, driven by a curiosity to explore the role of meta-stereotypes in the experience of reducing meat and/or dairy foods."

4.4 Findings

We generated six themes from the data (see Table 22). The full supporting quotes for all themes can be found in the NVivo file uploaded on the OSF.

Participants described many barriers to consuming less meat and/or dairy. The first theme, 'It Breaks the Bank', revealed the cost of convenient vegan foods as the barrier with most mentions (N = 191). The second theme, 'All That Processed Vegan Food', revealed health values and concerns about the dietary transition (N = 134). The third theme, 'Interpreted Observations of Vegans', reflected how personal experiences shape stereotypes and meta-stereotypes about vegans and veganism. The fourth theme, 'Closeness to Vegans and How it Reflects in Language', revealed how participants' sense of closeness to vegans was reflected in the language they used to describe vegans. The fifth theme, 'Reducers Categorised as Vegans' delved into how omnivores categorised reducers as vegans. The sixth theme 'The Web of Influences' captured participants' reactions to social categorisations and the different ways of how social perceptions and social discourse about vegans influenced their experiences.

Table 22 – Table of Themes

1. "It Breaks the Bank": Perceived Cost Barriers
2. "All That Processed Vegan Food": Perceived Health Barriers
3. "When We Hear Vegans, We Hear Activists": Interpreted Observations of Vegans
4. Closeness to Vegans and How it Reflects in Language
5. "You Might Remind People of Vegans": Reducers Categorised as Vegans
6. "It's Uncomfortable Being Different": The Web of Influence

Questions were formulated for participants to share their own experiences or perceptions from hypothetical situations, allowing the subtleties of the research topic to emerge — often missed by more quantitative research questions. Participants' extracts mostly reflected real-life examples (e.g., Themes 1 and 2) and occasionally contrasted experiences with perceptions of others (for all other

themes). Participants' sharing of the barriers other people face translated a sense of recognition of shared social problems, whereas their experiences around managing opinions of omnivores about vegans reflected their cultural perceptions. This work aimed to explore these social and cultural perceptions, and later highlight some of our interpretations of the different outcomes when differentiating between personal experiences and hypothetical situations.

4.4.1 Theme 1: "It Breaks the Bank": Perceived Cost Barriers.

Cost emerged as the most frequent barrier. Most participants sought convenient meat and dairy alternatives, often in the form of ready-made substitutes. However, these options were perceived as unaffordable (e.g., P169), particularly with the increased cost of living. Participants experienced these alternatives as more expensive than meat and dairy (e.g., P19, P106). Participants also mentioned their friends' reluctance to try a meat-free diet, using the cost of vegan foods as a justification for resisting dietary change (e.g., P86). Furthermore, participants perceived cooking for family members who were unwilling to consume plant-based meals as costly, requiring separate meal preparations. Even when family members were open to experimenting with new dishes, the perceived risk of disliking unfamiliar foods was considered costly and wasteful (e.g., P126). Cost barriers led to increased resistance to purchasing unfamiliar plant-based products (e.g., P71). Moreover, participants perceived the cost of vegetable and fresh foods to have increased in recent years (e.g., P84).

While some participants did not perceive cost as a barrier, they recognised that it is perceived as such by others. For example, one participant mentioned the financial and health benefits of cooking from scratch, acknowledging that most people opt for processed ready-made meat and dairy-free meals (e.g., P80). See Table 23 for supporting quotes.

It is essential to contextualise our findings on the barriers to reducing meat and/or dairy intake within the framework of changes that may be affecting people's socio-economic status. The United Kingdom witnessed an increased cost of living in the years 2022 and 2023, when the data were collected. In this regard, it may be relevant to highlight that on average, participants did not feel

relatively wealthy compared to others and felt they lacked sufficient money. Yet, on average, they reported living in a relatively wealthy neighbourhood.

Table 23 - Data extracts for Theme 1

Perceived Cost Barriers	
Trying new products as risky and potentially wasteful	*"Everyone is struggling for money so it's so easy to just stick something quick in the oven instead of having to think of a good recipe that everyone will enjoy or run the risk of people not liking it and then wasting money."* (169)
Cost of living and prices of meat and dairy alternative	*"The ability to reduce meat and dairy intake whilst still keeping costs relatively low given the cost-of-living crisis is off-putting."* (P19)
Meat is cheaper than the convenient meat and dairy alternative	*"The variety of meat free options that break the bank! The price is very off putting when there are cheaper meat options."* (P106)
Cost as a perceived barrier	*"Also, my friends often bring an argument of financial reasons when I try to introduce vegetarian diet for them, they say they are too poor to become vegetarians and maintain healthy diet."* (P86)
Risk of cooking for others	*"it's a big risk to try sometime totally new. I tried a chickpea and cauliflower curry which was risky. one child didn't like Cauliflower the other chickpeas. My husband didn't like it. it was a wasted meal that no one was keen to try again."* (P126)
Risk of choosing unfamiliar products	*"A family go to the supermarket to choose vegan food. They are confronted with lots of plant-based products they are not familiar with because they have been cooking with meat for so long. They panic and go back to eating meat or they eat expensive ready-made food and cannot keep it up. It's a lot of effort"* (P71)
Inflation and vegetable prices	*"The fact that vegetables etc are often more expensive than before, and sometimes more than meat." (P84)*
Cost as an excuse: perceived barrier	*"A lack of desire is the biggest issue, I hear so often people saying 'it's too expensive to buy vegan foods (or eat healthily) but this is totally wrong. It's only expensive if you buy pre-prepared processed food*

stuffs, if you buy fresh/frozen/dried it's cheap but it does mean actually making an effort and doing some cooking.” (P80)

Overall, most participants equated vegan foods with processed and ready-made vegan foods, which they perceived as expensive. Yet, a few participants did not see cost as a barrier. These participants held a broader understanding of what constitutes vegan foods (e.g., dried pulses, legumes, vegetables), which they considered to be affordable options.

4.4.2 Theme 2: “All That Processed Vegan Food”: Perceived Health Barriers

A large proportion of participants reduced meat and/or dairy for health reasons, with nutritional value and health concerns emerging as the second most frequently mentioned barrier. Participants associated vegan foods with highly processed foods, leading to concerns about insufficient protein content and nutritional value in vegan diets (e.g., P2). Participants struggled to view the added nutritional (e.g., P193) and environmental (e.g., P1) benefits that these meat-free and dairy-free products may bring. Many remained attached to traditional perceptions of the health benefits of meat and dairy foods (e.g., P129). Due to the perceived lack of healthy ready-made alternatives (e.g., P158), most acknowledged that cooking from scratch would be a better solution.

However, some participants perceived cooking from scratch as a hindrance due to the required knowledge and experience needed (e.g., P8). Buying convenient foods (P71) and cooking with meat and dairy (P246) had become habitual to most. Shifting these habitual patterns required effortful considerations and time, with time being perceived as a scarce resource in the demands of the modern life (e.g., P144). Notably, some participants highlighted people’s reluctance to cook from scratch. One participant perceived that the reason for people’s reluctance to cooking was a lack of motivation to do so and that they relied on excuses to avoid cooking from scratch (e.g., P80). In a specific medical context, one nurse shared her encounter with vegans being in a weak state because of nutritional deficiencies (e.g., P96). She highlighted that they “are not doing their homework” possibly referring to a perception of vegans, lacking

the knowledge around consuming a well-rounded diet. See Table 24 for all supporting quotes.

Table 24 - Data extracts for Theme 2

All That Processed Vegan Food	
Nutritional barrier	*"People's biggest barrier is knowing how to still get all their nutrients and protein from other products and not meat or diary."* (P2)
Health concerns	*"The biggest obstacle is that enough vegans think they're not getting enough protein. I don't think they are necessarily healthy, and they can still be eating processed food."* (P193)
Defining healthy eating	*"Eating well as a vegan does not mean buying all that processed vegan food that you can get in shops (I don't think this food is necessarily better for you than meat or dairy, or even better for the environment)."* (P1)
Perceived health concerns of cutting out meat	*"After a few months of cutting out meat, she felt tired and unwell. The doctors did a blood test which came back to show she was deficient in many vitamins."* (P129)
A need for healthier ready-made vegan meals	*"Lack of healthy alternatives, which are also overpriced, very salty, carbohydrate-rich, non-nutritious, and overall, very unhealthy"* (P158)
Lack of cooking knowledge and skills	*"The lack of experience of cooking and information about new recipes holds us back and stops us being adventurous and experimental."* (P8)
Habit of buying meat-based convenient foods	*"The biggest barrier is that people do not know how to cook from scratch and without meat. I think it is because they are just used to buying ready meals, pizzas, burgers, etc, which contain meat"* (P71)
Habits of cooking with meat and dairy	*"Most people lack the imagination to know how to cook without using meat and dairy. It's a traditional way to cook with meat and dairy and it's not obvious where to go to find out what's possible to create without these foods."* (P246)
Research requires time	*"I think time is a problem researching healthy alternatives. Vegan cooking requires more thought, planning and preparation"* (P144)

Time management as an excuse: perceived barrier	*"I don't believe time is a factor, people always find time to do what they want e.g., muck about on their phones… Just because people can't be bothered doesn't mean they can't.... So ultimately people are just too idle."* (P80)
Lack of knowledge on how to consume a nutritious vegan diet	"*In my experience as a nurse, I saw vegans coming in a very weak state because they are lacking essential vitamins, because they didn't do their homework."* (P96)

Participants generally perceived health barriers to their transition towards reducing meat and/or dairy foods. Many felt that embracing a healthy vegan diet demands time, effort, and the challenge of breaking habitual reliance on convenient meat-based meals. A minority held a different perspective. To them, time management strategies were key in adopting the habit of cooking from scratch. One common barrier to consuming a healthy vegan diet was the lack of knowledge on how to do so.

4.4.3 Theme 3: "When We Hear Vegans, We Hear Activists": Interpreted Observations of Vegans

Many participants held stereotypes about vegans, based on personal observations and experiences with vegans. They generalised views about vegans from those experiences to the entire dietary group. For example, one participant subscribed to mainstream stereotypical views about vegans based on an experience with a vegan friend who, according to the participant, imposed their vegan dietary ideologies on others (e.g., P243). Others formed their perceptions of vegans through online portrayals of vegan activists (e.g., P122) or social discourse about vegans (e.g., P90), where vegans are compared to religious extremists (e.g., P169). See Table 25 for supporting quotes.

Table 25 - Data extracts for the first part of Theme 3

Interpreted Negative Observations of Vegans	
Opinions of vegans based on personal experiences	"*Vegans have a bad reputation for trying to push veganism on everyone, and judging people who aren't. I had a vegan friend who would always comment on meals that people chose, and this was very annoying and judgemental*." (P243)
Generalised perception of vegans from online platforms portrait of vegans	"*[Friends or family] think that vegans are preachy and aggressive. I feel that they have a point as I often see vegans attacking people online for eating meat and yet they'll happily buy leather goods."* (P122)
Over-representation of vegan activists linked to social discourse about vegans	"*I just think when we hear of vegans, we only really hear of the more extreme activists who are very vocal about their beliefs rather than someone who may just want to do their bit for the environment, their health, and animal welfare."* (P90)
Just like preachy Christians	*"I guess it's the same as preachy Christians, that puts me off joining a church or being more involved with a church."* (P169)

A proportion of participants (N = 86) held entirely positive views of vegans. Views of vegans were mostly positive when encounters with vegans were positive, and in most cases, when people had friends and family members who were vegan (e.g., P114). Vegans' dietary choices were sometimes accepted as environmentally friendly, and aligned with advice to reduce meat and dairy foods (e.g., P158). Some participants were also aware that not all vegans ascribe to the stereotypes known about vegans (e.g., P10). A minority moved away from perceiving vegans as a unified entity and were receptive to viewing vegans as individuals with nuanced attitudes (e.g., P164). See Table 26 for supporting quotes.

Table 26 - Data extracts for the second part of Theme 3

Interpreted Positive and Balanced Observations of Vegans	
Positive views of vegans from positive encounters	*"Since there are members of my friend group who are vegetarians and vegans, the meat eaters of my group generally view vegans positively."* (P114)

Veganism as healthy and environmentally friendly	*"I think people would mostly view this in a fairly positive light, considering that it would be a good choice for the environment, and reducing meat is something that is being encouraged, from a medical and health point of view, too."* (e.g., P158)
Awareness of common cognitive distortions	*"Of course, not all vegans are like that."* (P10)
Perception of vegans as a nuanced group	*"I think my family and friends think vegans are hippies and are preachy about eating meat. I don't think it's fair to generalise." (*P164*)*

Overall, many participants held vegan stereotypes and formed generalised views about vegans from their personal observations and experiences. Indeed, stereotypes are a result of social categorisation where people perceive outgroup members as homogenous, as would suggest the social identity approach (Abrams & Hogg, 1990; Brown, 2000). Views of vegans from participants and their surroundings were mixed and stereotypes and meta-stereotypes of vegans were seldomly solely positive. Participants also perceived others evaluating vegans negatively, suggesting meta-prejudice (Gordijn, 2002). Although views of vegans varied according to people's experiences with individual vegans, a few recognised that these perceptions should not be generalised to all vegans.

4.4.4 Theme 4: Closeness to Vegans and How it Reflects in Language

Here, we present a few examples to illustrate participants' sense of closeness to vegans and how it was reflected in their language when expressing opinions of vegans. Participants were shown nine pairs of intersecting circles (Figure 6) and asked to choose which best represented how close they felt to vegans. The measure ranged from two non-intersecting circles (lack of closeness) to two completely overlapping circles (strong sense of closeness). Interestingly, all participants who chose the circles 8 and 9 labelled themselves as omnivores or reducers, whilst participants who labelled themselves as vegetarians were scattered across circles 1 and 7.

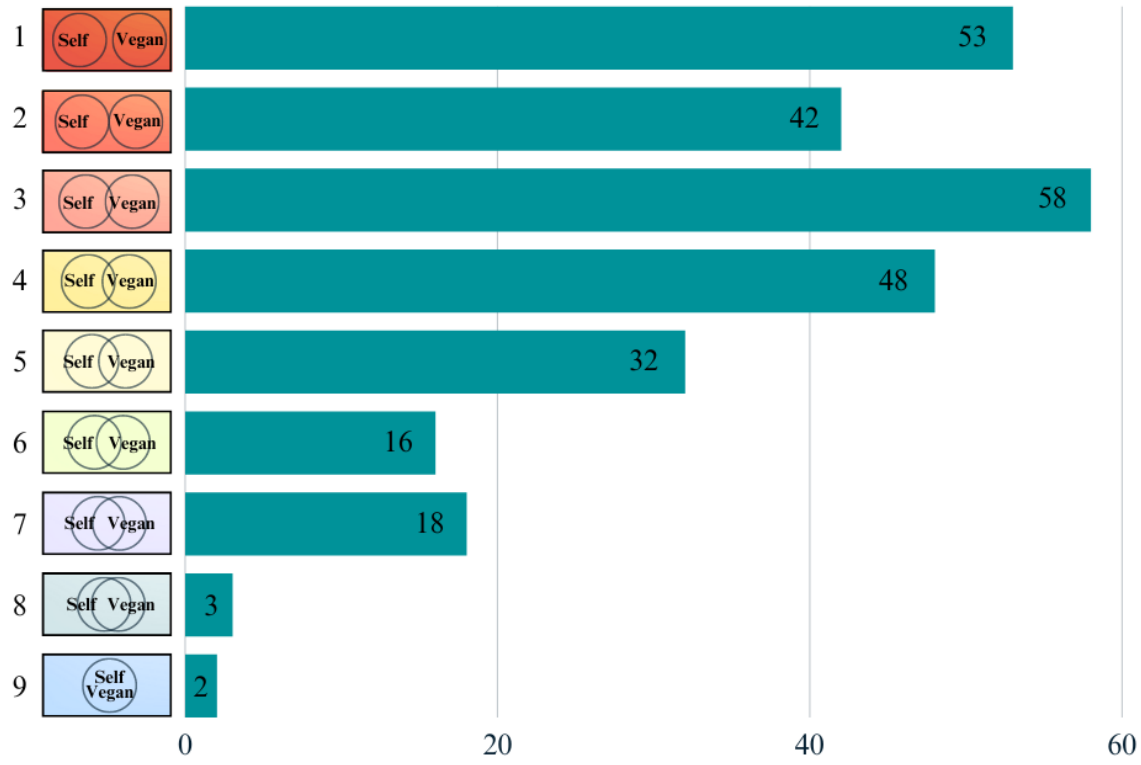

Figure 6 - Sense of closeness to vegans

Note. Bar chart showing the number of participants for each of the nine closeness to vegan categories. The y-axis shows reducers' sense of closeness to vegans depicted by nine representations of overlapping circles, from "1" showing a lack of closeness to vegans, to "9" showing concentric circles and a strong sense of closeness to vegans. The x-axis shows the frequency of cases. Participants mostly chose circles with small to medium overlapping areas.

Participants' sense of closeness to vegans was reflected in the language they used to describe them. Those who felt less close to vegans tended to use stereotypical words like 'extremist', 'restrictive', 'preachy', 'strange' (e.g., P223; P93 in circle 1), often echoing the negative views from friends and family. Others, while not entirely ascribe to negative views about vegans, acknowledged that these perceptions are generalised, traditional, and an unfair representation of the diversity of vegans (e.g., P164 in circle 3), yet still felt less close to vegans. Perhaps, this is because people's views of vegans were sometimes mixed (e.g., P190 in circle 4). A minority of participants who felt less close to vegans used words related to progressive views when mentioning vegans (e.g., P45 in circle 3; P53 in circle 2), including words related to environmental consciousness, ethics, and open-mindedness.

Participants with moderate overlapping circles typically described their diet as a personal choice. Those who felt weakly or moderately close to vegans were sometimes tolerant or indifferent toward others' diets, perceiving that these choices had no impact on them. For instance, one participant mentioned the freedom of vegans choose their diet, since diet is a personal choice (e.g., P178 in circle 3). They later shared a hypothetical scenario of how reducers might be influenced by social discourse about vegans, leading to feelings of shame. Another participant shared that social discourse about vegans should not impact people because one's diet is a personal choice (e.g., P18 in circle 5). She later mentioned that her opinion should not matter and used the phrase 'You do you, and I'll do me', interpreted as conditional granting of permission for others to be and act as themselves, as long as they receive the same treatment. See Table 27 for supporting quotes.

Table 27 - Data extracts for Theme 4

Closeness to Vegans' and How it Reflects in Language	
Relationality according to negative perceived traits: Aligned self and other views	"*I think most of my family think vegans are weird and annoying. I think those perceptions are probably pretty correct as I do think vegans are a bit strange.*" (P223)
Being different seen as odd and weird	*"The main problem is that most vegans are a touch odd / less mainstream. They are a particular bunch that a lot of people simply find weird."* (P93)
Opposite self and other views	*"I think my family and friends think vegans are hippies and are preachy about eating meat. I don't think it's fair to generalise."* (P164)
Mixed views	*"My family and friends see it as a choice like I do and respect it. I agree, but sometimes, I also feel that they can be restricted or a nuisance when eating out!" (*P190*)*
Aligned self and other ethical views of vegans	*"My family are very accepting, as they don't eat much meat. They see vegans as the way forward for the planet, as it's more sustainable. I feel that is a good opinion to have."* (P45)

Aligned self and other progressive views of vegans	*"Most of my friends are really open minded though and think that vegans are great - this is the view that I'd agree with."* (P53)
Diet is a personal choice: Shame triggered if identified as vegans	*"My family/friends and colleagues are absolutely not concerned with other people's food choices, as it should be! It is not anyone's business what people chose to eat."* […] *"Some people might be ashamed to 'identify' as vegan, due to what the overall public opinion is. Historically, vegans have been mocked for always sharing their dietary preferences… This might put off people going vegan/reducing meat and dairy consumption."* (P178)
Diet is a personal choice: granting permission	*"I don't believe there would be an impact [of people's opinion about vegans on reducers]."* […] *"Surely, it's a personal decision that you've thought about… So, what I think about them [vegans] should not really matter. You do you and I'll do me."* (P18)

Note. […] indicates that a portion of the text has been omitted to remove irrelevant information and to focus on the essential parts of the passage.

In general, how participants relate to vegans may translate into the language they use to describe vegans. Some participants who felt less close to vegans used negative stereotypic words more frequently to describe vegans, whereas others who moderately related to vegans sometimes purveyed that 'diet is a personal choice'.

4.4.5 Theme 5: "You Might Remind People of Vegans": Reducers Categorised as Vegans

Participants' responses suggested that other people found reducers more difficult to categorise than vegans. Consequently, participants reported experiences of being compared to and sometimes categorised as vegans. They mentioned that omnivores and vegans judged them for reducing meat and/or dairy intake too much or not reducing enough (e.g., P268). Participants shared concerns about the barriers that arose from being associated with vegans (e.g., P199). Specifically, P199 shared frustration about 'militant vegans', pointing to vegan activists, giving reducers 'a bad name'. P199 perceived that this may have tarnished reducers' reputation and that, reducers, in the public's eye, are now being stereotyped as well.

Some participants shared that engaging in 'preaching' about their dietary choices triggered people into categorising reducers similarly to vegan activists (e.g., P10). Others mentioned that reducers who openly shared their goals of becoming vegans were automatically associated with stereotypical vegan traits (e.g., P73). Perceptions of reducers differed based on their motives. For instance, reducers' motives were sometimes perceived as inconsistent with their behaviours (e.g., P30). When reducers' motives for avoiding meat and/or dairy were health-related, people seemed more 'forgiving' (e.g., P19). One participant aligned her views with the negative opinions her family and friends held about vegans. She stated her health and financial motives for reducing meat and dairy as personal reasons, possibly to separate herself from social discourse about ethical vegans (e.g., P62). Indeed, some participants felt that those reducing for the environment or animal welfare were associated with vegan activists in social contexts (e.g., P65). See Table 28 for supporting quotes.

Table 28 - Data extracts for Theme 5

Reducers Categorised as vegans triggered by Motives	
An all or nothing mentality	*"I think if you say you are reducing dairy, people, omnivores but mostly vegans, assume you are trying but failing to be a vegan, and judge on that, unless you explain why you are."* (P268)
Preachiness triggers social categorisation	*"If the person who is trying to reduce their consumption starts lecturing people about this and suggesting that they do the same, it might remind other people of their interactions with vegans who have been very judgemental of other people."* (P10)
Social categorisation leading to assumptions	*"If they mention that they are vegan, people may think they are preaching to them and would think less of them".* (P73)
Militant vegans	*"They [friends and family] see them as annoying. I don't love that these views are kind of justified. Those militant vegans have been giving us reducers a bad name for years!"* (P199)

Reducers' motives are questioned	*"I've lost count of the number of times that I've been asked to justify why I eat eggs but won't touch meat or other products that involve killing an animal."* (P30)
Financial and health motives: separation from vegan stereotypes	*"I must admit that I have some of the same perceptions as my family and friends but that won't stop me from editing my diet for financial and health reasons."* (P62)
Ethical motives association with vegan activists	"*There are also a worry people might think you are judging what they are eating if you are making changes to your diet for the environment, especially if they are big dairy or meat consumers themselves*." (P65)

Overall, reducers' behaviours and identity were perceived as unclear to their social surroundings and were therefore categorised and associated with vegans, a process aligning with social identity approach (Abrams & Hogg, 1990; Brown, 2000). Participants reported that reducers were compared to vegans if specific vegan stereotyped characteristics were triggered (e.g., preachiness) or if the motive for reducing meat and dairy foods aligned with those of vegan activists (e.g., ethics).

4.4.6 Theme 6: "It's Uncomfortable Being Different": The Web of Influence

This theme illustrates the various pathways of meta-stereotypes and stereotypes influencing reducers. Participants used strategies to mitigate perceptions or experiences of being stereotyped as vegans, such as avoiding communication and hiding their diets. As Vorauer et al. (1998) highlighted, when an individual feels stereotyped by an outgroup, they may avoid the outgroup and may experience anxiety during contact. This aligns with previous research on the impact of meta-stereotypes on intergroup contact and avoidance in other domains (MacInnis & Hodson, 2012).

Eating in social contexts that promote meat and/or dairy foods (e.g., with family members, friends, or when eating out) hindered participants' efforts to reduce their meat and/or dairy intake (e.g., P7-A, P222). Participants often reported dealing with people's negative opinions about the vegan diet and vegans (e.g., P59). Communication was challenging in these situations, as resisting negative

views would require effortful explanations and sometimes triggered the fear of being ridiculed (e.g., P53, P253). Consequently, participants often ate meat and dairy foods in these contexts, to avoid causing inconvenience (e.g., P237), appearing difficult (e.g., P7-B) or being associated with vegans (e.g., P30, P199). However, by concealing their diet (e.g., P111), reducers missed opportunities for finding support (e.g., P125). See Table 29 for the supporting quotes.

Table 29 - Data extracts for the first part of Theme 6

The Web of Influence and Avoiding Communication	
Eating in social situations: meta-stereotypes from family and friends	*"Most of it is about social situations. I can control what I eat when cooking for myself or ordering just for myself but if I am with friends or family eating in or in restaurants, there is a sort of pressure sometimes."* (P7) – A
Negative meta-stereotypes and Strong views of vegan	*"People's opinions may have a negative impact as some people can have strong views on people becoming vegan."* (P59)
Negative meta-stereotypes and effortful communication	*"I don't agree with this [negative perceptions of vegans], but I wouldn't get into a discussion about it"* (P53)
Efforts of explaining one's diet and anticipated stereotypes	*"I'm tired of explaining why I'm trying to reduce my meat intake… I don't really want to be ridiculed"* (P253)
Meta-perceptions and feeling like an inconvenience	*"They might be concerned about people close to them being annoyed by their choice, if it is perceived to create inconvenience for them."* (P237)
Meta-stereotypes and resistance to difference	*"Sometimes it feels like people think I'm just trying to be difficult by asking for vegan options at restaurants."* (P7 – B)
Meta-stereotypes and going with the flow	"*It's often just easier to go with the flow. It can be hard to adjust to a new diet and if you are facing criticism from others for it, it could be the last straw. It can be hard to go against the herd."* (P30)
Anticipated stereotypes and making a vegan fuss	*"Everybody has listened to too many militant judgemental vegans for me to want to label myself as even vegetarian. That means that when people do try*

	to feed me, they usually give me meat/dairy/fish, because I don't want to make a vegan fuss!" (P199)
Stereotypes and meta-stereotypes influence on behaviour	"*The opinion of others is a strong thing, if someone judges you for doing something you are less likely to do it*." (P111)
Meta-stereotypes and hidden diets	*"The person may feel that they cannot share an intent to reduce dairy and meat consumption to avoid these views affecting their relationships. And by not sharing their intent this will reduce peer support for their choice."* (P125)

Meta-stereotypes and endorsement of other's social discourse of vegans influenced reducers in many ways. When reducers belonged to an environment free from judgement, they reported feeling encouraged and valued. Participants also shared that support from others could have a strong impact on people's motivation to pursue their reduction efforts (e.g., P.23, P73). Importantly, participants highlighted the need for positive vegan role models to temper negative social influences (e.g., P16, P196). See Table 30 for supporting quotes.

Table 30 - Data extracts for the second part of Theme 6

The Web of Positive Influence	
Positive influence, inclusivity, and motivation	"*I think nowadays people are more aware and less judgemental. So, I am sure this person will feel encouraged and appreciated*." (P23)
Concessions and Support	*"My family and friends will cook vegan food or eat it when we are out to make somebody else feel more comfortable."* (P73)
Vegan role models	*"It would be great to have stronger, positive vegan role models – sports stars, models etc who look and are healthy and strong."* (P16)
Availability of Positive Vegan Role Models	*"When more people will start giving up meat, including public figures, others will follow."* (P196)

Participants reported frequent instances where the opinions of vegans from their social context negatively influenced their consumption behaviours and choices, or that of others in hypothetical situations. Participants mentioned that negative opinions from others might impact people's consumption levels, impeding them from holding the intention to reduce further (e.g., P66), or the motivation to do so (e.g., P138, P59). Choices in social contexts became effortful to manage, and sometimes, participants questioned the choices they made as they challenged the status quo (e.g., P112). Challenging the status quo required a level of openness to criticism or a strong conviction of the choices one makes. Indeed, participants perceived that other's opinion could shake their beliefs about reducing their dairy consumption (e.g., P85).

Participants described that reducers who perceive negative opinions of vegans from others worry being judged as vegans and may not want to be identified as vegans (e.g., P65). In turn, this worry triggered the need to carve their own consumption behaviours and identities as separate from vegans (e.g., P12). Some even reported experiences where their friends, in the presence of others who consume meat or dairy, apologised for reducing these foods, and then disidentified themselves from vegans by stating "*we are not one of those radical vegans*" (e.g., P9). Others described hypothetical situations of reducers disidentifying themselves from vegans to avoid being labelled as *"rabbit vegans"* (P107). In these cases, vegans were seen as an outgroup.

Participants also reported experiencing negative affects within various social context. When the norms of consuming meat and/or dairy were salient, participants felt pressurised to consume more meat or dairy (e.g., P17), and felt awkward if chose to consume foods that are counter mainstream norms (e.g., P38). On the other hand, when participants were present with vegans, they felt unwelcomed by vegans as they felt judged by them for not doing enough (e.g., P96 – A). Feeling unwelcomed by vegans or perceiving that vegans think reducers are not doing enough would attract less people to reduce their meat and/or dairy intake (P96 – B). These findings highlight the mechanisms behind anxious intergroup interactions specific to the context of meat and/or dairy reduction that the meta-stereotype literature highlights (Gómez, 2002; Macinnis, 2009; Otten, 2002; Vorauer et al., 1998). See Table 31 for supporting quotes.

Table 31 - Data extracts for the third part of theme 6

The Web of Negative Influences	
Negative influence on reduction intentions	"*People can sometimes have a negative opinion about vegans which could put some people off further lowering their consumption.*" (P66)
Negative influence on the motivation to further reduce	"*I think people think vegans are a bit weird and judge them a lot. Something like that doesn't sound easy to go through when trying to change a diet. It may make them give it up*" (P138)
	"These perceptions can be upsetting and demotivating. People might be reluctant to start the new dietary choice" (P59)
Negative influence on choice	"*If you are ok with dealing with family who might not understand completely due to generational differences then it will be ok however if I felt intimidated it would make me question my choice*" (P112)
Negative influence on belief	"*I think other people's opinions could impact this person by the belief it is not the natural thing to do.*" (P85)
Worries about being perceived as vegans.	"*If people find vegans judgemental or extreme in general, then you might worry that you would be perceived in the same way as a reducer.*" (P65)
Reducers finding their unique way	"*They may not want to be judged like vegans are often done. They may want to carve their own consumption level and not want to be labelled as vegan.*" (P12)
Disidentification	*"I have friends who apologise for reducing and say, "but we are not one of those radical vegans"."* (P9)
Meta-stereotypes and vegans as outgroups	*They'll talk about "rabbit vegans" in a negative manner, making someone think they don't want to become part of that crowd."* (P107)
Feeling Pressured to consume meat.	"*I think people are pressurised by others to continue eating meat.*" (P17)

Feelings of awkwardness	*"I would feel awkward if they thought I was like that. I would also feel awkward choosing to eat something different than them."* (P38)
Feeling unwelcomed	*"A lot of people seem to think that vegans are annoying and shove it up people's faces that they're vegan and how others should be vegan too. It can make someone trying to reduce their meat and dairy consumption to feel overwhelmed and unwelcomed.* (P96 – A)
The feeling of not doing enough negatively influences the motivation to further reduce	*As a result, less people would try to do reduce their intake as they'd feel like they're not doing enough because some vegans may be attacking them and saying that they are not doing enough."* (P96 – B)

Participants reported insights into potential reasons for the variability in the degree to which people are negatively influenced by perceptions about vegans. Self-confidence was one factor (e.g., P80). Participants viewed people swayed by others as weak (e.g., 99) or more mainstream, conforming to social norms rather than choosing to be a 'rebel' (e.g., P89). Being different posed a threat to participants highly conforming to social norms. Some participants chose to conform to group norms out of fear of standing out when the need to fit in was high (e.g., P148), even if it caused them health issues (e.g., P7). In certain social context, the need to belong sometimes overshadowed their reduction goals (P88). Overall, distinctions emerged between those aspiring to change their actions to match their social groups and those embracing their uniqueness and individuality (P151). See Table 32 for supporting quotes.

Table 32 - Data extracts for the fourth part of Theme 6

The Web of Influence and levels of Conformity and belonging	
Self-confidence	*"If the person has any self-confidence, why would they care what others think or don't think. From my perspective anyone who let themselves be influenced by overs*

	something as incidental as what they have for dinner, has bigger issues than reducing their meat intake." (P80)
Convictions and norms	"*Depends on the individual and how robust they are to other people's views – one person may rebel and form their own judgments whereas another person may choose to be more mainstream and stick to the "norm*"." (P89)
	"*If they are swayed by others then they are weak*." (P99)
Conformity	"*My personal experience is pressure in front of others and what they may think of me wanting to be different, I like to be popular and fit in.*" (P148)
Going with the flow	*"Even if dairy makes me sick, I still don't make much fuss over it if with friends and family. If someone else gets vegan options I do too, or if they're easily available but if not, then I try and go with whatever is available, particularly with regards to dairy."* (P7)
Conformity due to the need for belonging	"*Societal pressure is a huge factor because humans like to belong to social groups*" (P88)
Community conformity vs individualistic behaviour	*"Some people would feel pressure and uncomfortable being different while others wouldn't care and accept, they have a right to be an individual."* (P151)

In general, participants concealed their dietary choices and avoided challenging conversations, as they preferred not to stand out. They adjusted their behaviours to conform with norms around eating meat and dairy to minimise resistance. By doing so, they decreased opportunities to find support. The availability of positive role models could have facilitated these necessary discussions. The impact of stereotypes and meta-stereotypes about vegans on people's experiences of reducing meat and/or dairy intake manifested in various ways. The degree of influence varied according to people's self-confidence and level of conformity.

4.5 Discussion

Our aim was to explore barriers to reducing meat and/or dairy intake among female reducers, and to understand the role of stereotypes and meta-stereotypes in their lived experiences.

4.5.1 Summary of Findings

A wide range of barriers to reducing meat and/or dairy intake were mentioned that aligned with previous work (Graça et al., 2019). Participants most frequently mentioned their perceptions of the cost of vegan foods and health concerns around adopting a vegan diet as barriers. Many associated vegan foods with processed, ready-made options, leading to the perceptions that vegan foods were costly and unhealthy. This perception might be influenced by the increased cost of living and the lack of time to cook from scratch. A small proportion of participants did not perceive cost and health concerns as barriers to consuming vegan foods. They had developed a habit of cooking from scratch, and perceived the vegan diet as a cost-efficient and healthy choice. These participants highlighted the importance of time management in behaviour change, and recognised that the lack of will to manage time may hinder others' adoption of vegan diet.

We also found evidence of meta-stereotypes about vegans, and explored how they affected meat and/or dairy reducers. Meta-stereotypes of vegans were rarely solely positive, and stereotypes about vegans varied based on people's experiences with vegans or media portrayals. In social settings where meat was the norm, participants shared experiences where they, or other reducers, felt categorised as vegans if they displayed ethical motives or traits associated with vegans, such as being preachy. Engaging in conversations about their diet became challenging in these contexts, leading them to adopt avoidant strategies and hide their diets. They often felt annoyed or uncomfortable when pressured to consume meat and/or dairy foods. As a result, they disidentified themselves from vegans, due to worrying about being judged as vegans. Some participants did not feel close to vegans and used negative stereotypic language to describe them. Other participants felt moderately close to vegans, holding mixed views, and often describing their diet as a personal choice. This perspective may

illustrate a conditional granting of permission for others to freely choose their diets if they receive the same freedom in return.

Influences from stereotyping and meta-stereotyping vegans varied across participants. Participants shared that negative views of vegans from omnivores could alter one's choice of not consuming meat and/or dairy foods, and could hinder one's willingness to adopt a reduced meat and/or dairy diet. These negative perceptions sometimes shook their beliefs about their choices. The degree of negative influences varied according to peoples' self-confidence, conformity to social groups, and need for belonging. Generally, participants chose to align their behaviours with the meat-eating norms to avoid standing out. The desire to belong to their social groups, despite holding opposing beliefs, outweighed their goal to reduce meat and/or dairy consumption in those situations. By doing so, participants avoided disclosing their dietary goals and limited their opportunities for support. Participants perceived having a supportive social circle as crucial, however, because it could help promote their motivation, sense of belonging, and maintained dietary efforts.

4.5.2Methodological Triangulation

We compared results from both our quantitative (Wehbe et al., 2023) and the current qualitative work to identify convergences and inconsistencies across findings. Findings from both methods revealed that reducers hold both stereotypes and meta-stereotypes about vegans. In line with the quantitative findings (Wehbe et al., 2023), the open-ended survey responses revealed more frequent mentions of negative stereotypes from omnivores (i.e., negative meta-stereotypes) than positive ones. Some participants agreed with the negative views of vegans, yet most reported their mixed views of vegans. They held generally positive perceptions of vegans, provided that their freedom of choice is respected. Thus, perceived stereotypes about vegans, particularly negative ones, appeared as salient representations in people's minds. Moreover, our qualitative findings complemented previous quantitative results, illustrating that reducers who felt less close to vegans held negative stereotypes about vegans, which may then translate into the language they used to describe vegans.

However, inconsistencies with previous findings also emerged. The quantitative results revealed no significant association between negative meta-stereotypes and maintaining dietary changes, reduction intentions, and consumption expectations of meat and/or dairy. In contrast, open-ended responses revealed concerns about self-image influencing reducers' choices in social contexts promoting meat and/or dairy consumption, and their willingness to further reduce the intake of these foods, which aligns with previous work (Rosenfeld, Rothgerber, & Janet Tomiyama, 2020). These inconsistencies may arise from the mixed format of questions – closed-ended and open-ended. While closed-ended survey options provide standardised answers, questions that enable respondents to answer in their own words yield more nuanced responses and allow for the reporting of atypical individual experiences that researchers did not account for (Braun et al., 2020).

Inconsistencies could also arise because our quantitative analysis directly assessed the association of meta-stereotypes with participants' dietary change maintenance, while the qualitative analysis explored how meta-stereotypes might influence people (i.e., participants themselves or others) who are reducing their meat and/or dairy intake. People often infer their attitudes and feelings by observing their own behaviour (Bem, 1972). Yet, when people are not fully conscious of the influences affecting them, they may form explanations based on their behaviour rather than acknowledging external factors. Reducers may attribute their dietary choices more to their own autonomy than to external pressures, for example by claiming that their diet is a personal choice, and may perceive others as more prone to such influences, as attribution bias theory would suggest (Heider, 2013). According to the fundamental attribution error (Ross, 1977), people tend to overestimate the role of personality traits and underestimate the role of situation when interpreting other people's behaviour. For example, our participants may have interpreted how people's opinions influence others by attributing these influences on personal characteristics, such as participants perceiving others being influences by negative opinions of vegans due to their lack of confidence, rather than considering the contextual factors in which the behaviour occurs.

4.5.3 Links to Previous Research

4.5.3.1 Social Identity Approach

Our results can be understood in the context of the social identity approach (Abrams & Hogg, 1990; Brown, 2000). Stereotypes are a consequence of social categorisation, as they stem from the tendency to perceive outgroup members as homogenous, and to see the ingroup in more favourite light than the outgroup. Participants in our study held negative stereotypes and meta-stereotypes of vegans, which in turn influenced their experiences, self-perceptions, and identity. Our findings revealed that reducers believed omnivores stereotyped vegans, and were sometimes labelled as vegans, which led many reducers to disidentify with vegans, perhaps out of fear of being judged by others. Reducers disidentified from vegans by defining themselves in contrast to what they are not (e.g., vegans). This helped them define who they are in the process of shifting towards consuming less meat and/or dairy. In turn, viewing vegans as categorically separate may have decreased reducers' willingness to fully eliminate these foods as a way to reduce the likelihood of being categorised as vegans. This suggests that negative meta-stereotypes may play an important role in shaping pro-environmental behaviour.

4.5.3.2 Meta-Stereotypes within Identity Context

Contrary to previous research suggesting that the activation of meta-stereotypes is particularly relevant for individuals who strongly identify with their ingroup in contexts where the (stereotyping) outgroup is powerful (Lammers et al., 2008), our findings suggest that both individuals who strongly identify with their ingroups (i.e., vegans), and individuals who do not have strong social identities around dietary behaviours (i.e., reducers) held similar patterns of meta-stereotypes around vegans. Holding negative meta-stereotypes of vegans has led reducers to feel less close to vegans (Wehbe et al., 2023) and to disidentify with vegans, as evidenced in our current findings. These results align with social identity approach (Abrams & Hogg, 1990; Brown, 2000; Hornsey, 2008), in that stereotypes and meta-stereotypes contribute to social categorisation, and in turn, resulting in dis-identification with the outgroup.

Our findings may provide insights into why reducers may adopt flexible dietary goals and are less likely to maintain their dietary changes. Only a smaller proportion of our participants identified as vegetarians and pescetarian, when most reducers labelled themselves as omnivores, sometimes flexitarians, and mostly as reducers when they did not necessarily identify with existing dietary labels. As research suggests on flexitarians (Rosenfeld, Rothgerber, & Janet Tomiyama, 2020), perhaps this is because reducers who labelled themselves as omnivores, flexitarians, or reducers, their social identity is less central to their sense of self. Yet, social identification has been shown an important factor for dietary maintenance within people who adopt restrictive diets. Indeed, social identification positively predicted people's adherence to a vegan and vegetarian diet (Cruwys et al., 2020). This might explain reducers being less strict with their efforts to maintain their dietary changes. Such findings have implications for the social identity approach (Abrams & Hogg, 1990; Brown, 2000; Hornsey, 2008) in the context of reducers, in that, holding stereotypes and negative meta-stereotypes of vegans can not only influence whether reducers identify with vegans, but whether they are willing to adopt a vegan diet.

4.5.3.3 Links to the Vegan Paradox Framework

De Groeve and colleagues proposed a theoretical framework whereby vegans trigger a cognitive dissonance in non-vegans, referred to as the vegan paradox (De Groeve & Rosenfeld, 2022). This dissonance activates both moral and carnist identities, giving rise to either supportive (e.g., moral and committed) or defensive (arrogant and overcommitted) views towards vegans. Our work offers several theoretical contributions to this framework, and in doing so, extends the literature around the role of meta-stereotypes in intergroup relations from dietary domains. Our paper reveals that when asked to describe vegans, participants most frequently associated vegans with vegan advocates, which may also signal the awareness of perceived stereotypes of vegans, whether favourable or unfavourable. Reducers holding the diverse meta-perceptions of vegans may experience a cognitive dissonance leading to an internal conflict.

To resolve their dissonance, reducers may enact personal views that either support or reject vegans. Indeed, in social context where vegan stereotypes were prominent, reducers reported opting to hide their diets, consuming meat

or dairy, and feeling conflicted when doing so (Wehbe et al., 2022). Moreover, researchers have found omnivores perceiving flexitarians as undecisive (De Groeve et al., 2021), which may also reflect reducers' internal conflict of consuming meat or dairy, and worry about being judged when navigating situations where consuming meat is the norm. Therefore, meta-stereotypes could contribute to the dissonance created by the vegan paradox. This dissonance is salient in reducers' minds without necessarily encountering vegans.

Reducers perceiving stereotypes about vegans experience these criticisms indirectly, through a mental process that activates concerns about their own evaluation in relation to vegans when meta-stereotypes about vegans are activated. This might impact their confidence in their daily choices around reducing meat and/or dairy intake, and might play an important role in shaping self-image. Our findings leverage insights from theories of intergroup relations to highlight the symbolic threats to social identity (Nelson, 2015; Stephan & Stephan, 2017). Perceived vegan stereotypes could pose a symbolic threat to reducers, because hidden diets — a method of avoidance of conflict from social settings — may result in a weakened sense of belonging and identity. Future research should assess these claims with empirical testing for validation.

4.5.4Applied Implications

Our findings revealed that most participants perceived vegan foods as highly processed food products. They reported struggling with the cost of these foods and struggling with understanding of the impact of these processed foods on their health and the environment. Moreover, participants may have perceived veganism as denoting a class marker, and accessing vegan foods may represent one's financial capacity (Asher & Cherry, 2015). Governments use food-based dietary guidelines to outline what constitutes a healthy diet to guide their population. However, limited documentation is available on how countries implement these guidelines and whether they monitor and evaluate the implementation (WHO, 2013). This process must consider the food system in its totality, taking into account all the barriers and enhancers and how they interact using a food systems approach (see Wijesinha-Bettoni et al., 2021), by empowering people for sustainable consumption (United Nations, 2022).

We suggest implications for policies, as effective strategies to adopt and incorporates a food agency-based teaching pedagogy that would recognise the complexities of both the social and cognitive aspects of cooking, such as one's food environment (e.g., time and resource constraints), and tailor it to diverse populations. For example, implementing a food agency pedagogy instructing students in schools and universities undertaking taking food-related courses periodically. This approach emphasises an embodied knowledge, learning by doing through repetition, and by emphasising one's agency with their food choices and how these impact the individual and the larger social structure. Such skill acquisition could play a crucial role in the development of healthy habits starting from earlier years.

Cooking healthy vegan foods from scratch was not part of most participants' habits, and was seen as effortful, time-consuming, and demanded developing skills. This aligns with a recent study reporting a more general decline of home-cooked meals since 1980's (Griffith et al., 2022), due to increased price of raw ingredients and time constraints. Highlighting the social and emotional benefits of cooking at home, rather just the implications for health, can be more effective in encouraging home cooking meals (Mills et al., 2020). Policies promoting home cooking, such as cooking lessons in school, should integrate a focus on hedonic pleasures through the social and emotional aspects of cooking that are central in other cultures (e.g., Mediterranean countries), to address this issue effectively.

Our results revealed strong evidence that negative vegan meta-stereotypes contribute to intergroup polarisation. Experimental research that aimed to shift intergroup perceptions involving 10,207 participants across 26 countries demonstrated that informing people of their inaccurate meta-stereotypes can generate positive intergroup relations (Ruggeri et al., 2021). Other research has shown no effect when attempting to correct these social discourses (see Lewis & Michalak, 2019). Tempering meta-stereotypes is a complex issue, and might require multi-faceted strategies. Rather than only focusing on tampering these negative misperceptions, building a sense of community by highlighting common values could potentially help mitigate this issue. For example, policies that promote food agency-based teaching pedagogy should also focus on enhancing of

common values, such as values around community service, which can strengthen people's sense of belonging, acting as a preconditions for developing social identities (Li et al., 2022). These efforts could shift people's attention from a polarised mindset to a unified purpose, further supporting initiatives that promote climate-friendly dietary shift.

4.5.5 Strengths and Limitations

The key strength of our research is the novel finding that meta-stereotypes could be linked to people's willingness to reduce meat and/or dairy foods. Furthermore, the application of methodological triangulation added valuable insights about the impact of negative meta-stereotypes in reducers' dietary transitions. We also used investigator triangulation as the data was coded by two researchers, all while holding periodic meetings for reflexivity and bringing in different perspectives, negative case analysis, strengthening the robustness and transparency of our analysis process. Moreover, using qualitative surveys offers a rich data from diverse perspectives of individuals and experiences in underexplored researched domains (Braun et al., 2020). Finally, our large sample, due to our quantitative power analysis, ensured a broad representation of female reducers.

Our research is not without limitations. Firstly, we asked about how people's opinion about vegans influences reducers, rather than asking directly, for example, about meta-stereotypes. This may limit direct validation of findings from both qualitative and quantitative responses. Nonetheless, triangulating these findings provided rich exploration of experiences of reducing meat and/or dairy, enhanced data quality, and credibility of the research. Moreover, despite the broad representation of experiences, our findings cannot be generalised, specifically across gender, socioeconomic background, or cultures, and future research would benefit from replicating our work and exploring differences in these contexts to advance our representation of the processes at hand. However, the aim of our qualitative research was not to ensure representativeness. Our focus was on exploring diversity within lived experiences of women reducing meat and/or dairy intake, and comparing these findings with previous work. Finally, some responses were delivered in the context of

hypothetical situations. These are linked to participants' perceptions, as perceptions are relevant to explore when examining meta-stereotypes.

4.6 Conclusions

Women reducing meat and/or dairy intake held predominantly negative meta-stereotypes of vegans. These perceptions impacted reducers' experiences of dietary transitions. The tendency to conform to existing social norms, even when these need to change for sustainability of health and the planet, may impede efforts towards promoting sustainable changes. Polarised group perceptions can be difficult to alter, since these perceptions are deeply rooted in people's experiences of vegans. Therefore, moving away from interventions that attempt to change these perceptions, and instead, actively embracing roles as community members that foster a collective commitment to enhancing the health of our planet is needed.

5 Chapter 5: General Discussion

5.1 Overview Of Findings

The aim of this thesis was twofold. First, I applied a self-control perspective to understand the role of habits, identities, and social norms in the transition towards a diet with less meat and/or dairy intake. Second, I explored perceptions of vegans and how these perceptions play out in people's experiences of dietary shifts. Across Chapters 2 - 4, I explored the enablers and barriers that reducers face when limiting their meat and/or dairy consumption. I also investigated the relationship between meta-stereotypes and identity, sense of closeness to vegans, and motivation to maintain dietary changes amongst two dietary groups (vegans and reducers).

The main contents of this thesis can be summarised as follows. In Chapter 2, participants reported being exposed to internal and external cues, and the need for self-control arose due to conflicts between desires and goals. I illustrated the strategies used to manage these experiences of conflict. In Chapter 3, I found strong evidence for both stereotypes and meta-stereotypes of vegans. Vegans and reducers held stronger meta-stereotypes about vegans than stereotypes. Among both groups, there was no evidence of an association of negative meta-stereotypes with the motivation to maintain dietary change. In Chapter 4, I found evidence that both stereotyping and meta-stereotyping vegans can influence people's experiences of reducing their meat and/or dairy consumption. I also illustrated reducers' perceptions of the major barriers (cost and health concerns) to reducing the intake of these foods, and the underlying cause for such perceptions. I suggested that efforts towards increasing the development of ready-made plant-based foods that are healthy and cost effective are important.

I will now present a summary of the main findings of this thesis, outlining the overall theoretical and applied implications of the results and how they contribute to the wider literature. Finally, I will highlight the strengths and limitations of the research and potential directions for further research based on the insights gained from this work.

5.2 Summary of Key Findings

In Chapter 2, I conducted a qualitative online study, and aimed to identify how environmentally motivated reducers experience their dietary transition into consuming less meat and/or dairy from a self-control perspective. Conflicting motivations arose in various situations. I found incompatibilities between desires and long-term goals that arose when participants were exposed to internal cues (e.g., hunger and mood states). External cues from the physical and social environment, such as the availability, cost, and attractiveness of foods, as well as negative social feedback, triggered conflicting motivations. Other conflicting experiences included the cognitive dissonance of consuming meat or dairy, and experiences of negative affect (e.g., feelings of being judged and pressured into consuming meat or dairy). These feelings led to annoyance and inconvenience when rejecting meat or dairy foods from friends and family. Participants struggled to balance the different motives (sustainability, health, and enjoyment of taste) and were uncertain about the environmental impact of plant-based alternatives compared to animal-based foods, reflecting participants' lack of knowledge around the impact of foods. Overall, reducers' experiences of conflict included motivational conflict, as well as cognitive and affective conflict, often prompting the need for self-control in reducing meat and/or dairy intake.

The use of different strategies, such as avoidance of choice situations or environments that triggered the desire to consume meat or dairy (e.g., avoiding meat aisles in a supermarket), communication, action planning, and recruiting social support helped manage the challenges that arose from experiences of conflict and from participants' food and social environments. The preferred strategies were those that required the least effort (e.g., food substitutions and avoiding temptation). Moreover, a large proportion of participants preferred the label "reducers" rather than "flexitarian", a term participants viewed as unfamiliar despite its common use by researchers. This suggests that lay people's representations of how they identify themselves may differ from the labels researchers use to identify certain dietary groups. Overall, these findings suggest that self-control resources, social environments, social identity, and motivational forces that influence food decisions (e.g., cost, health, and

sustainability) play key roles in the reduction process, and that the need for self-control varied across situations.

Through two cross-sectional, survey-based studies, the aim of Chapter 3 was to investigate meta-stereotypes and stereotypes of vegans among female vegans and reducers, and I examined whether holding these stereotypes was related to the motivation for following dietary patterns and the sense of closeness to vegans. I found that both groups believed that omnivores stereotype vegans (meta-stereotyping) more negatively than positively. For both vegans and reducers, negative meta-stereotypes of vegans were stronger than positive meta-stereotypes, and positive stereotypes of vegans were stronger than negative stereotypes. The findings revealed that both groups saw vegans in a more positive light, on average, than they believed vegans were seen by omnivores. These findings reflect polarisation between the different dietary groups, such that both vegans and reducers believe omnivores view vegans more negatively than positively.

I also examined whether (meta-)stereotypes were linked to vegans' identity, to reducers' sense of closeness to vegans, and to the motivation to maintain dietary changes for both groups. For vegans, meta-stereotypes of vegans were not associated with an increased sense of vegan identity neither were they associated with views of omnivores. For reducers, I found that reducers who held more positive views about vegans (i.e., stronger positive stereotypes and weaker negative stereotypes) felt closer to vegans as a group. For vegans, negative stereotypes, rather than negative meta-stereotypes, were associated with lower likelihood of fully maintaining a vegan diet. For reducers, I found no evidence of an association of negative meta-stereotypes with any of the measures of maintaining one's diet, including consumption expectations in various social and non-social situations.

In sum, these findings suggest that meta-stereotypes may reflect social polarisation, and meta-stereotypes may not necessarily be linked to people's motivation to reduce their meat and dairy consumption. Because the lack of evidence is not evidence of absence, exploring meta-stereotype processes through open-ended questions could bring further insights into how meta-

stereotypes influence this dietary behaviour. Open-ended questions allow respondents to provide detailed responses in their own words. This can uncover nuances, motivations, and links that might not be captured in closed-ended questions (Braun et al., 2020).

Through open-ended questions, the aims of Chapter 4 were therefore to explore the prevailing barriers to reducing meat and/or dairy intake among female reducers with open-ended questions, and to understand the role of stereotypes and meta-stereotypes in their experiences of reducing the intake of these foods in their diets. Perceptions of the cost of vegan foods and health concerns around adopting a vegan diet were the most frequently mentioned barriers, likely because of the representation of vegan foods as being highly processed. Aligning with results from Chapter 3, meta-stereotypes of vegans were mostly negative, with stereotypes about vegans varying according to personal experiences or representations of vegan extremists or activists. How closely participants felt to vegans was reflected in the language they used to describe vegans. Participants held both positive and negative stereotypes of vegans, and predominantly negative meta-stereotypes of vegans.

The influence of these perceptions held by reducers manifested in several ways. Notable negative influences encompassed various aspects of food choices in social contexts. Participants often reported dealing with omnivorous friends and family members' negative opinions about their diet, and that people reducing their meat or dairy intake where often judged them as vegans. In these social situations, participants often consumed meat or dairy foods, as they felt awkward eating foods against mainstream norms, and avoided causing inconvenience, appearing difficult, or being associated with vegans. To mitigate perceptions or experiences of being stereotyped as vegans, participants avoided communicating with omnivorous friends or family members, as resisting negative views would require effortful explanations and sometimes triggered the fear of being ridiculed. Challenging the status quo required a level of openness to criticism or a strong conviction of the choices one makes. By hiding their diets, participants missed opportunities for finding support.

Moreover, participants mentioned that negative opinions from others might impact people's consumption levels, intentions to reduce further, or the motivation to do so. Indeed, participants perceived that these other's opinion could shake their beliefs about reducing their dairy consumption. Participants described that reducers who perceive negative opinions of vegans from others worry being judged as vegans and may not want to be identified as vegans. They also felt unwelcomed by vegans. As a result, they disidentified themselves from vegans, seeing vegans an outgroup, to avoid being labelled as vegans. In turn, this worry triggered the need to carve their own consumption behaviours and identities as separate from vegans.

Positive influences included feelings of inclusivity and support, which drove participants' motivation to further reduce meat or dairy intake. The extent of influence on participants varied depending on reducers' self-confidence, level of conformity to social groups, and need for belonging. These findings provide insights into individuals' perceptions of vegans and vegan diets. They also shed light on how these perceptions, along with external influences, impact emotional states, behaviours, and motivations. Integrating findings from both Chapters 3 and 4 provides novel evidence of the role of meta-stereotype processes in motivation and behavioural change. Inconsistencies emerged within findings from Chapter 3 and 4, despite the efforts to account for social situations. While quantitative results revealed no significant association between negative meta-stereotypes and maintaining dietary changes, reduction intentions, and consumption expectations of meat and/or dairy, results from open-ended responses revealed concerns about self-image influencing reducers' choices in social contexts promoting meat and/or dairy consumption, and their willingness to further reduce the intake of these foods.

Inconsistencies may have arisen because quantitative analysis focused on the link between meta-stereotypes and participants' dietary change maintenance, while qualitative analysis explored how these stereotypes impact individuals' experiences of reducing meat and/or dairy intake. People often assess their attitudes through their behaviour, potentially overlooking external influences. This self-awareness can lead individuals to attribute dietary choices to personal autonomy rather than external pressures, as attribution bias theory suggests

(Heider, 2013). The fundamental attribution error (Ross, 1977) suggests people may overemphasise personal traits and neglect situational factors when interpreting others' behaviours. Participants may think that people's opinions influence others, for example, by attributing these influences to personal characteristics (e.g., lack of confidence) rather than considering the contextual factors in which the behaviour occurs.

Participants may have underestimated the influences of people's opinion on themselves, while overestimating these influences on others. In Chapter 2, participants were directly asked about the extent to which they were influenced by others. Despite many participants denying such influences, responses to their survey questions unveiled a multitude of conflicting experiences. In an effort to delve deeper into social influences and address participants' reluctance to admit such influences, I posed additional questions. Specifically, I inquired whether the opinions of others exerted an influence on them, those within their immediate surroundings, or individuals in hypothetical scenarios. Interestingly, most participants conceded that people's opinions do indeed have an impact on others who are in the process of reducing. This suggests a potential disparity between how people understand influences of opinions on others and on themselves.

5.3 The Role of Habits in the Transition Towards Diets with Less Meat and/or Dairy

5.3.1 A Grounded Cognition Perspective on Desire and Habit

It was apparent from participants' reports how the various external (e.g., physical and social) and internal contexts cued the consumption of meat and/or dairy. The physical environment included the cost and availability of foods, as well as the sensory aspects of foods, such as the smell of bacon when walking past their favourite restaurant. The social dimension encompassed shared meals with friends or family, and the prevailing socials norms around consuming meat and/or dairy. In addition to the external contexts, internal cues included bodily and cognitive states such as hunger, health concerns, and various mood states. Cues from people's environment influenced their desire to consume meat and/or dairy, as well as the enactment of habitual behaviours related to consuming

meat and/or dairy. It was necessary to regulate desires and habitual responses from the complex interplay of immediate internal and external environmental factors. It is, however, challenging to distinguish behaviours motivated by desire and habitual behaviours.

By adopting a grounded cognition perspective (Papies & Barsalou, 2015), both desires and habits are framed as resulting from situated conceptualisations. From this viewpoint, habitual behaviours are seen as goal-directed or motivated behaviours. Cognitive representations of food features and contexts are stored in memory as situated conceptualisations, that are re-activated when elements of these representations are experienced. Representations can activate habits, as well as desires and rewarding experiences of consuming foods. Traditionally, habitual behaviours are defined as learned responses to situational cues that are regularly performed in the same context (Gardner, 2015), yet the role of reward in habit performance is not taken into account. The findings of this thesis suggest that consuming meat and/or dairy was a habitual behaviour, as participants ate these foods since their earlier years and in specific social and non-social contexts, and the habit of consuming meat or dairy was motivated by desire.

5.3.2 The Role of Reward in the Habit of Consuming Meat and/or Dairy

Altering the behaviour of consuming meat and/or dairy required habit change, and rewarding experiences played a significant role in changing these habits. Participants reported that their behaviours (e.g., consuming meat) were motivated by desire (e.g., the desire to consume meat or the desire to belong to their social circle). The rewarding experiences of food, such as the enjoyment of the taste of meat or dairy and the dislike of the taste of the alternative options, fuelled participants' desire to consume meat or dairy, and triggered the habit of consuming meat or dairy (Wehbe et al., 2022). These findings align with other research, where situations prompted simulations of eating and enjoying meat and dairy foods, which triggered the desire and sometimes the consumption of these foods (see Papies et al., 2021, 2022). These situations were often social in nature, and thus the rewards associated with consuming meat or dairy also

included the reward from feelings of belonging to one's immediate social group. This suggests that reward expectation may play a role in the consumption of a meat and/or dairy, a behaviour typically performed when it is associated with rewarding outcomes.

Reward played an important role in forming new habits of reduced meat or dairy consumption. Participants reported enjoyable experiences when developing new habits around reducing meat or dairy foods, which reinforces the experienced intrinsic rewards. Their sense of automaticity increased when they repeatedly avoided eating meat and dairy foods, consistently opting for plant-based meals in certain situations. To resolve feeling conflicted in social situations, participants reframed consuming meat and/or dairy, shifting from seeing it as a failure to viewing it as a treat. Adopting these strategies proved to be rewarding, increased a sense of satisfaction, enjoyment, self-acceptance, and helped with maintaining reduction efforts over time. Forming new habits, such as that of planning, preparing, and consuming plant-based foods, required levels of enjoyment (e.g., acquiring the taste of plant-based alternatives, enjoyment of social support and cooking from scratch) to maintain their efforts. Enjoying the taste of plant-based foods was also an important factor in forming new habits of consuming plant-based meals. Extrinsic rewards included peer support, which acted as drivers to pursue their reduction efforts.

The habit of consuming meat and dairy, as well as forming and maintaining new habits of consuming plant-based foods over time may be motivated by desire and rewarding experiences. This aligns with other research suggesting that reinforcing enjoyment and pleasure when adopting the "desired" behaviour may lead to successful self-regulation, motivating individuals and often prompting them to reenact the behaviour (Bernecker & Becker, 2020). By activating the brain's reward system through the release of dopamine, this creates a positive association between a specific action and the pleasurable outcome (Wang et al., 2020).

Taken together, I illustrated the complexity of the interplay between various situational cues. Disrupting the habit of consuming meat or dairy as well as forming new habits of consuming plant-based foods were barriers to

participants. Meat and dairy consumption habits were driven by expectancies of enjoying these foods, and plant-based habit formation requires reward. These findings align with the grounded cognition perspective (Papies & Barsalou, 2015), conceptualising behaviour change as habit change, and disrupting and forming habits requires overriding rewarding simulations with new ones that support the "desired" behaviour (Papies, Barsalou, et al., 2022).

5.4 When Self-Control Fails

Conflict arose from incompatibility between desires and long-term goals, and led to the need for self-control. I illustrated this in Chapter 2, and found similar processes with different cues in Chapter 4. In Chapter 4, the desire to belong to immediate social groups was triggered within social contexts where eating meat or dairy was the norm, and was incompatible with long-term goals of reducing meat and dairy. Often, self-control processes failed as most participants preferred conforming to the normative behaviour of consuming meat or dairy.

Self-control processes failed when conflict was not detected. As illustrated in Chapter 2, self-control processes varied across situations and were triggered when conflict was detected. Some participants reported not feeling conflicted, and felt comfortable bypassing the dissonance by justifying why they did not want to fully eliminate meat or dairy. In such situations, consuming meat or dairy was the default. Others reported stronger experiences of conflict and motivation to control difficulties and efforts that arose from different situations. This is consistent with self-control theories (Inzlicht et al., 2014; Kotabe & Hofmann, 2015). Research suggests that detecting conflict is necessary to activate control efforts and effortful self-control processes (Inzlicht et al., 2014; Kotabe & Hofmann, 2015).

There are other reasons as to why self-control processes might fail. As illustrated by Kotabe & Hofmann (2015), people may experience self-control failures when they are overtaken by their desires. Findings from Chapter 2 suggested that participants felt strong desires to consume meat and dairy foods in response to situational cues (e.g., hunger, smell of meat). Additionally, findings from Chapter 4 revealed that participants felt a compelling desire to belong to their

immediate social group. The desire to safeguard a positive self-image may have also hindered self-control processes, such as protecting oneself from the judgement of others by conforming to behaviours that align with the social norms of the group (e.g., consuming meat with omnivores). In these situations, participants chose to consume meat or dairy, despite their goal of reducing the intake of these foods. This aligns with research suggesting that when overwhelming desires overtake higher-order processes, this leads to self-control failures (Hofmann & Van Dillen, 2012).

Concealing goals in social situations may have led to failures in self-control and enabled the behaviour of consuming meat and/or dairy. Findings from Chapter 2 and 4 highlighted how some reducers chose to conceal their goals from others (e.g., avoiding difficult discussions or fear of being stigmatised), and seldomly found people to support them in their dietary transition. This may have been an additional barrier to their efforts to modify their diets. Research highlight that concealing goals decrease behaviour change effectiveness, as research suggested that publicly setting goals is an effective behaviour change technique (Epton et al., 2017). Concealing one's goals around reducing meat and/or dairy, while experiencing strong desires to consuming these foods, may have contributed to feeling conflicted.

5.5 Meta-stereotypes, Social Norms, and Social Conformity

Social norms played a significant role in shaping people's choices to either consume or not consume meat or dairy. Situations where friends and families consumed meat or dairy reflected what is commonly done or approved within this social group, depicting norms in favour of consuming these foods. Efforts were needed to deviate from socially normative behaviours, such as that of consuming meat and/or dairy. Conforming to social norms was therefore the default.

Social conformity shaped behaviour as participants navigated societal expectations in various social situations. In Chapter 2 and 4, participants shared their concerns about revealing their diets to families and friends that are omnivorous, primarily to avoid uncomfortable discussions around conflicting

beliefs and opinions. Reducers often reported feeling pressured by omnivorous friends and family that offered meat or dairy-based foods, and feared causing inconvenience if they refused these foods. They shared strong beliefs that omnivores negatively stereotype vegans (i.e., meta-stereotypes) and concerns about being stereotyped as vegans in certain situations. These concerns manifested into experiences of actually being stereotyped as vegans when sharing their motives for reducing (e.g., ethics) and when perceived as "preachy". Altering how they are presenting themselves in their social context and how they present their identity to others would therefore aid people in navigating the influences of such meta-stereotypes. Therefore, meta-stereotypes may have played a role in the formation of social expectations that align with stereotypes around vegans and vegan foods, which may then lead to conforming to social norms around consuming meat and dairy to avoid the discomfort of social disapproval.

Conformity may moderate the relationship between meta-stereotypes and behaviour. By conforming to social norms, individuals often find themselves adjusting their behaviour to fit into behaviours adopted by their immediate group. Aligning with research on social modelling of food (Cruwys et al., 2015; Higgs, 2015), my findings highlight how reducers are influenced by what other people eat or do not eat, and use others' eating behaviours as a guide to what types of foods they can consume. To many of the participants in Chapter 4, it was easier to conform to the social norms around eating meat and succumb to consuming meat or dairy in these situations, even if they suffered from health consequences (e.g., consuming dairy when being lactose intolerant). Indeed, research suggests that people adopt or reject specific behaviours based on their beliefs about how others in their community perceive the behaviour (Janz & Becker, 1984; Jose et al., 2021, p. 19). Both reducers and vegans believe that omnivores stereotype vegans negatively (e.g., preachy and self-righteous), which may highlight stigmatisation of vegans. Individuals who might otherwise be open to exploring plant-based diets may feel deterred due to the fear of being associated with these negative stereotypes. In these situations, social support is massively impactful in increasing individual agency and confidence in pursuing a reduced meat and/or dairy diet. Future research could explore the moderation

effect of conformity on the relationship between meta-stereotypes and the behaviour of consuming meat and/or dairy.

5.6 Theoretical Contributions and Implications

5.6.1 Meta-Stereotypes within the COM-B Model

Within the COM-B framework (Atkins et al., 2017), the classification of meta-stereotypes within the domains of the model is not necessarily straightforward. Beliefs about the positive or negative outcome expectancy of a behaviour are typically classified into the motivation domain of the model. Meta-stereotypes are beliefs about what another group think of a group they belong to. It is therefore unclear whether meta-stereotypes could be placed within the motivational domain, despite it reflecting motivational processes, such as being less motivated to adopt plant-based diets when negative meta-stereotypes are endorsed. Meta-stereotypes also reflect a social aspect, classifying the self within the context of intergroup perceptions, suggesting its potential placement within the social opportunity domain of the model.

One of the limitations of the COM-B model is its lack of specificity in defining the psychological and social factors that underpin behaviour. Therefore, integrating meta-stereotypes into one domain by refining definitions regarding the various domains of the model could enhance the construct validity of the model. Additionally, a well-defined and integrated conceptualisation of meta-stereotypes within one domain would allow for a more coherent analysis of their impact on behaviour change, such as the mediation analysis carried out by Willmott et al. (2021) to understand the interplay of the various domains. However, meta-stereotypes are multi-faceted constructs. Being a social cognitive process with motivational implications, meta-stereotypes reflect real-world complexity, and future research could explore the best approach to addressing the issue at hand.

5.6.2 The Potential Role of Meta-Stereotypes in Choosing Dietary Labels

As dietary choices reflect people's values, beliefs, and motives (Barton et al., 2015; Chen & Antonelli, 2020), reducers may be aware of how their dietary choices are perceived by others and may be worried about how they are interpreted. They often encounter challenges related to how they are perceived and what their dietary choices communicate, especially when compared to vegans, who face significant stigma (Wehbe et al., 2023b). Findings from Chapter 2 and 4 suggest that most reducers rejected existing labels (e.g., flexitarians or even vegans), and sometimes avoided disclosing their dietary choices. Reducers expected feeling evaluated and judged in certain situations, and defined themselves as separate from other stigmatised groups. They tended to hide their dietary choices and motives not to feel judged. Only a smaller sample of reducers identified as vegetarians and pescetarian, when most reducers labelled themselves as omnivores, sometimes flexitarians, and mostly as reducers when they did not necessarily identify with existing dietary labels. As research suggests (Rosenfeld, Rothgerber, & Tomiyama, 2020), perhaps this is because reducers' social identity is less central to their sense of self in comparison to vegans. This may have negative consequences for their reduction efforts, because social identification is an important factor for dietary maintenance (Cruwys et al., 2020).

The Unified Model of Vegetarian Identity has unified the fundamental psychological aspects of vegetarianism (Rosenfeld & Burrow, 2017), and has been applied to conceptualise identities in the context of vegan identity (Markowski, 2023), and more recently, flexitarian identity (Rosenfeld, Rothgerber, & Tomiyama, 2020). Similarly, this model can be applied to reducers, individuals who do not necessarily view their diet as central to their sense of self. By examining the contextual dimension (e.g., historical and sociocultural contexts), as well as the internalised (e.g., salience, centrality, motivation, and regard) and externalised (e.g., dietary pattern, label, and strictness) aspects of identity that the model suggests, researchers could gain deeper understanding on what promotes or hinders reducers from strongly identifying with existing dietary labels. Examining these aspects for reducers

could also capture how a less central sense of identity manifests through behaviour.

Researchers have suggested that developing an identity in dietary contexts must be conceptualised in terms of a developmental perspective (Rosenfeld & Burrow, 2017a). In fact, my findings align with other research suggesting that awareness, knowledge, and dietary motivations develop gradually (Wehbe et al., 2022) and over time (Ruby et al., 2013), and individuals may alter their food choices accordingly. However, little is known about the role of meta-stereotypes on how reducers conceptualise their identity around their diets and how these identities are formed over time.

I highlight one implication from my findings for the identity framework by Rosenfeld & Burrow, (2017). Findings from my research present strong evidences for meta-stereotypes, in that reducers and vegans strongly believe that omnivores negatively stereotype vegans. As reducers report high concerns about being judged and stereotyped as vegans, I suggest that the identity framework should consider meta-stereotypes as a possible factor contributing to their diets being less central to their sense of selves. To provide a unifying framework for a broad scope of findings on identity, meta-stereotype process must be taken into account, as evidence explored in this thesis suggests that they might impact behaviour. This could be addressed in future research.

5.6.3 Meat and Dairy Consumption; a Potential Identity Content?

The debate regarding whether social groups, such as veganism, constitute a part of a social identity or represent a distinct social identity itself has been a point of discussion in the literature. While the findings from this thesis do not address this question, I extended these discussions from the domain of veganism to the domain of reducers, a highly pivotal social group to examine for broader societal shifts, thus paving interesting avenues for future research.

Veganism, traditionally conceptualised through dietary practices (Rosenfeld & Burrow, 2018), encompasses a broader spectrum of behaviours, such as social activism, that guide a lifestyle excluding animal exploitation (Vestergren et al., 2019; Judge et al., 2022). These behaviours depend on contextual factors,

including health motives, ethical principles (e.g., environmental concerns, animal welfare, social justice), as well as group memberships (Vestergren et al., 2019; Judge et al., 2022). Vestergren et al. (2019) found that participating in collective action led environmental activists to adopt a vegan lifestyle. This revealed how shared behaviours in social contexts contribute to broader social identity formations. Social groups, whether characterised by shared opinions (e.g., feminist), practices (e.g., cyclists), or both (e.g., veganism), can play a pivotal role in identity formation.

Reducers, a social group that exhibit a flexible approach towards shared sustainable practices, represent a distinct and important group to explore. Despite members of the group sharing experiences of struggles (e.g., climate crisis), how reducers choose to identify themselves more strongly depended on intergroup processes, as evidenced in this thesis, rather than their motives. Nonetheless, their flexible behaviours and identities suggests potential attractiveness to new members, contrasting with groups with strict behaviours and identities such as vegans (Kurz et al., 2020). Thus, exploring reducers' social identity, specifically those motivated by environmental motives (see Wehbe et al, 2022), within the framework group membership would offers practical insights into broader societal shifts as well as theories on group identity dynamics.

When theorising the relationship between group processes and maintenance of sustainable behaviours, research often exclude the underpinning social mechanisms. Social identity and support are crucial for adherence to restricted diets like veganism (Cruwys et al., 2020; Hodson & Earle, 2018). However, the understanding of the social mechanisms enabling maintenance of these diets are often overlooked (Vestergren et al., 2018). This thesis addresses this gap by evidencing how intergroup perceptions can hinder the maintenance of reducing meat and dairy foods for reducers (Wehbe et al., 2023a, 2023b), a collective action required to mitigate climate degradation. Moreover, identifying with vegans can foster engagement in collective action for social change, providing a sense of belonging and purpose (see Tajfel & Turner, 1986; Vestergren et al., 2019). However, the relationship between group identification and collective action may be less straightforward (Kurz et al., 2020), as observed with reducers

in the context this thesis. Research highlights that intragroup dynamics influence actions and beliefs related to veganism (Vestergren et al., 2018). Reducers, characterised by low group identification, differ in their ways of coping with perceived intergroup conflicts, which might deter commitments to collective actions. Nonetheless, there is a need for research to further examine the theoretical social underpinnings of the maintenance of restricted behaviours, particularly across cultural contexts.

The findings from this thesis emphasised the role of intergroup perceptions and memberships in shaping social identity of reducers. Adopting a social identity approach enabled the identification of the various contexts that influence how reducers choose to identify themselves. This thesis underscores the importance of considering the broader social context in which social identities operate, acknowledging the dynamic nature of identity contents, and the potential for contextual factors that influences reducers' identity expression. Overall, I highlight the utility of the social identity approach in elucidating the complexities of social identity and encourage further research to continue examining the various contents of reducers' identity using identity-based approaches. When conceptualising and theorising social identities of reducers, addressing consumption choices in relation to social and motivational context can be seen as contents of a salient social identity, a similar argument researchers have pointed in the context of veganism (e.g., Stuart et al., 2013; Vestergren et al., 2018, 2019). Future research could explore how reducers' social identity forms and whether shared behaviours, such as the behaviour included in reducing meat and/or dairy consumption, contribute to one's social identity.

5.6.4New Outlook for Meta-stereotypes

Most research has examined meta-stereotypes within groups with inherent characteristics (e.g., race), others with acquired characteristics (e.g., politics). Yet, no research has examined whether there are differences in meta-stereotype processes between groups from acquired and inherent content. Inherent characteristics are fundamental aspects of an individual's identity that are present from early development. These characteristics often come with pre-

existing societal stereotypes, deeply ingrained due to historical, cultural, and societal factors, that individuals may internalise or confront throughout their lives. Moreover, individuals from groups with inherent characteristics have limited control over these characteristics. As a result, the effects of meta-stereotypes with these characteristics may be more resistant to change and can lead to systemic biases, discrimination, and inequalities.

Acquired characteristics, such as political affiliations and dietary choices, are based on individual decisions, beliefs, values, and experiences. These characteristics may evolve over time and can be influenced by various factors like education, environment, and personal experiences. Individuals may bypass the effects of meta-stereotypes by hiding their choices. In sum, while both inherent and acquired characteristics contribute to meta-stereotype processes, they differ in their foundation, influence, and perception within society. Recognising these differences is crucial for understanding how meta-stereotypes shape attitudes, behaviours, and interactions within and across different groups, and presents an exciting new outlook for future research.

Future research could examine impacts on dietary behaviours to enhance our understanding of existing conceptualisations of meta-stereotypes. Research that explored intergroup conflicts within political contexts (Appleby, 2018; Ruggeri et al., 2021), mostly focused on meta-evaluation and meta-accuracy, relating to the cognitive component of meta-stereotype processes (Gómez, 2002). Meta-stereotypes also hold a behavioural component and have mostly been examined in behaviours of intergroup contacts, such as the avoidance of intergroup contact, the establishment of a selective interaction, the hostility of attitudes towards the outgroup, or derogating outgroup members (Appleby, 2018; Gordijn et al., 2017; Klein & Azzi, 2001; Otten, 2002). No research has examined such processes in the context of dietary behaviours, specifically that of transitioning to consuming less meat and/or dairy.

5.6.5 Meta-stereotypes and Meta-prejudice

Meta-prejudice, referring to people's expectations of how members of other groups feel about their own group, may play a role in the dietary transition

towards consuming less meat or dairy. Meta-prejudice has been suggested to relate to meta-stereotypes, and influences intergroup relations (Gordijn, 2002). It is important to highlight the difference between stereotypes and prejudice. While stereotypes is referred as generalised beliefs about a group of people, prejudice is referred to as a negative attitude or feeling toward individuals based on their membership in a particular group (Devine, 1989).

Findings from Chapters 3 suggest how both vegans and reducers believe omnivores strongly and negatively stereotype vegans (meta-stereotype vegans), providing initial evidence on the role of meta-stereotypes in the dietary transition towards consuming less meat and/or dairy. Findings from Chapters 3 and 4 provide evidence that valence mattered when examining meta-stereotype processes. In other words, both vegans and reducers believed omnivores stereotyped vegans more negatively than they did themselves. This could reflect meta-prejudice. Moreover, researchers highlighted that the effects observed in studies on meta-stereotypes may not only be from the activation of meta-stereotypes, but meta-prejudice may also be causing these effects (Gordijn, 2002). The need for further research on the activation of meta-stereotypes and meta-prejudice, as well as their underlying cognitive and motivational processes, is emphasized in the concluding remarks.

5.6.6 Bridging Two Theories

Our findings on meta-stereotype process can be contextualised using both the vegan paradox and grounded cognition perspectives. The grounded cognition of desire and motivated behaviour (Papies & Barsalou, 2015) suggests that, when behaviours are repeated in a situation, people encode representations of eating experiences in their memory, and encountering representations within the environment may activate other features of the representation that are simulated as a response to a cue. Reducers may then encode representations of vegan foods in their memory. These representations may include sensory experiences of these foods, or may include the people with which these foods are consumed. For instance, reducers from Chapter 4 highlighted the support and ease they felt when consuming vegan dishes with vegans or the challenges that arose from dining with omnivorous friends and family.

Encountering a vegan dish may then activate affective memories of sharing a vegan meal with vegans (e.g., feeling supported) or the social interactions around consuming vegan foods with omnivorous friends (e.g., feeling judged). Perceiving vegans or a vegan dish may then simulate anticipated opinions and reactions of them consuming a vegan diet, often being stereotypic perceptions. As a result, reducers may be motivated to either consume vegan foods when with vegans, and avoid them when with omnivores, being rewarded by the enjoyment of feeling supported and avoiding being excluded in contexts and rewarded from feeling a sense of belonging.

Applying the vegan paradox framework brings forward added perspective to my findings. According to the vegan paradox, vegans trigger a cognitive dissonance in non-vegans (De Groeve & Rosenfeld, 2022), activated by a conflict between the moral and carnist identities omnivores hold. To resolve the dissonance, non-vegans either adopt supportive (e.g., moral and committed) or defensive (arrogant and overcommitted) views towards vegans, which influences their willingness to reduce meat and dairy consumption. Reducers, therefore, may experience such dissonance when perceiving vegans, and in turn, endorse favourable or unfavourable stereotypes about vegans.

The vegan paradox and grounded cognition perspectives differ in their level of scope; one focuses on affective responses that guide motivations specifically applied to omnivores and vegans, while the other focuses on the interplay between various domains such as cognition, affective, environmental factors, and bodily cues, and is applied to a wide range of behavioural domains. In the context of reducers, both perspectives add useful insights to understand how meta-stereotypes contribute to desired behavioural outcomes. Perceiving vegans or a vegan dish in one's environment can trigger affective simulations such as cognitive dissonance from both moral and carnist identities as well as cognitive simulations such as stereotypes and meta-stereotypes around consuming vegan foods, both affecting the willingness to consume vegan foods in specific situations. Such processes should be considered in future meta-stereotyping research.

5.7 Overall Applied Implications

This empirical work focused on the psychological processes that underpin shifting dietary behaviours, and was not set up to learn about the food system transformation in the context of reducing meat and/or dairy. However, participants' reports and experiences pointed towards aspects of the food system and the social political context that shapes their food choices. For example, participants mentioned affordability and perceived cost as their primary barrier to shifting diets to consuming less meat and/or dairy. They also mentioned availability and accessibility of plant-based foods in shops and restaurants, as well as their health concerns related to the existing meat and/or dairy alternatives. Others mentioned the appeal of meat and dairy-based foods from advertisement of these foods, and the challenges they experienced from resisting their desires to consume these foods. Participants mentioned the social pressures they felt to consume meat and/or dairy, and the stereotypes they experienced around plan-based diets and the people that consume plant-based diets. These components shaped their experience of reducing meat and/or dairy consumption and are part of the food system.

A system is made up of a group of different components, such as the individual, their immediate external environments, and policies, none of which are completely independent from one another (Béné, Prager, et al., 2019; Capone et al., 2014). These components are interconnected. For example, in a food system, the availability of plant-based foods in the vicinities depends on food shops, corner stores, or restaurants. These outlets depend on their suppliers, who may supply these foods according to their demand. The demand for plant-based foods might be affected by their cost or by people's purchase power. Other factors that may influence the demand of these foods are advertisements, and social acceptance of these foods, which in turn influences the economic landscape of cities, rural areas, and even countries. Adopting a system approach means acknowledging that heath and sustainability challenges emerges within a complex system, all while understanding the components at play within the system, and how they interact with one another, in order to create a paradigm shift that supports the resolution of the challenges at hand (Luke & Stamatakis, 2012). The individual is a fundamental component to the system, and yet

changing the system can also influence and support individual behavioural change. Next, I suggest the components that need changed in the system that would support people in their transition toward consuming less meat and/or dairy. See Nourish, (2020a) for a visual representation of the food system.

5.7.1 Knowledge, Education, and Public Awareness

Knowledge can prompt gradual change overtime, and the lack of knowledge can hinder motivations to maintain behavioural change. Findings from Chapter 2 indicate that knowledge can trigger the initiation of behavioural changes over time, exemplified by those participants who, after exposure to information (e.g. reading an article) felt motivated to initiate reducing their meat or dairy intake. Despite holding the knowledge of the health and environmental impacts of meat and dairy consumption, participants still faced challenges when trying to maintain dietary changes. Participants reported struggling to maintain their drive to continue reducing their meat and/or dairy intake. Participants reported lacking information on how to adopt a well-rounded diet, and struggled with developing skills to cook tasty plant-based foods. Moreover, participants reported strong concerns regarding health of what they perceived as plant-based foods, lacked the knowledge to cater a diet that is suitable for their health needs (e.g., people suffering from irritable bowel syndrome or celiac disease). Others felt that the older generation lacked the same knowledge they have about the health and environmental impact of consuming meat and dairy foods. Experiencing these knowledge barriers led to a decreased motivation to maintain dietary changes.

Collaborating with healthcare professionals to promote the health benefits of plant-based diets and to provide information on how to incorporate a healthy and well-balanced diet is therefore necessary, by tailoring plant-based diets to individual health needs (Prosen et al., 2023). There is a need to integrate nutritional education into healthcare programs and public health campaigns to better support people in transitioning to a plant-based diet without health concerns. Other strategies involve encouraging influencers, celebrities, and cultural icons who are healthy and consume plant-based diets to collaborate with healthcare professionals and promote plant-based diets (Phua et al., 2020).

The relationship between knowledge and behavioural change may be linked to cognitive dissonance, where conflicting information prompts individuals to either reinforce existing beliefs or adopt new ones. Indeed, participants felt a dissonance when exposed to information with a strong affective component that evoked emotions (e.g., documentaries by David Attenborough), and reported sudden change of behaviour regarding their meat and/or dairy consumption. Others, outside of the sample within the context of this thesis, may have adopted avoidance strategies, negative stereotypes, and do-gooder derogation. This would suggest a proactive approach to reinforce information that supports reducing meat and dairy, by countering beliefs that consuming meat is necessary and healthy and by reminding people that their food choices may violate their own values (Rothgerber, 2020). Knowledge can potentially help reduce stigma and stereotypes (Doley et al., 2017), increasing people's understanding of the biases and motivational processes involved in forming opinions about groups.

Researchers highlighted that such strategies might be more effective with women than with men, and with people holding strong health motives and conservative political beliefs (Rothgerber, 2020). In such cases, accentuating how farmed animals are contaminated with toxins, such as antibiotics, hormones, unnatural feed, would be an effective strategy to prompt change as well as foster lasting behavioural change (Rothgerber, 2020). Therefore, interventions should not rely solely on knowledge and education, but should integrate strategies to boost motivational processes, ensuring a comprehensive approach to fostering lasting behaviour change.

Knowledge, education, and public awareness is important in reducing meat and dairy consumption. Yet, sustaining dietary changes requires more than just knowledge. Despite public health and sustainability policies being built on the principle that knowledge is a driver influencing behaviour (Kelly & Backer, 2016), researchers argued against relying solely on knowledge-based interventions in public sustainability policy research (Suldovsky, 2017), and severely criticised knowledge-based interventions for politically polarised topics (e.g., climate change) as inaccurately simplifying the relationship between knowledge, attitudes, beliefs, and behaviours. Research illustrates that the

motivational processes such as desires, habits, and social norms can impede behaviour change, and must be considered (Papies, 2017).

5.7.2 Normalising Plant-based Diets through Economic Incentives and Food Industry Collaboration

Participants reported that availability, accessibility, and affordability of foods were barriers to reducing their meat and/or dairy consumption. They also mentioned the lack of diversity in alternatives, and their health concerns in relation to this lack of variety. Collaboration with restaurants and food services is therefore crucial to encourage the incorporation of diverse plant-based healthy options cooked from scratch into their menus, and avoid the processed plant-based foods that are unhealthy and unsustainable (Macdiarmid, 2022). Moreover, plant-based meals that are advertised as extra-ordinary experiences, by emphasising hedonism, are more appealing (Bertella et al., 2024). Simultaneously, creating economic incentives for farmers to promote a transition towards sustainable and plant-based farming practices (Canwat & Onakuse, 2022), as well as advocating for and implementing policies that support these goals, such as subsidies for plant-based agriculture and regulations on meat production, can significantly contribute to food system change (Springmann & Freund, 2022). Additionally, increasing funding and promoting research that supports system change that encourage plant-based diets is important.

Lastly, this thesis illustrated that recognising the role of stereotypes and meta-stereotypes as barriers to reducing meat and dairy consumption is essential. When the focus becomes on making plant-based foods the norm, this will indirectly address the challenges that arise from stereotypes concerns and meta-stereotypes, rather than focusing solely on sensitive educational programs that are not reliably successful at tempering stigma (FitzGerald et al., 2019).

Overall, reduction of meat and dairy demand through individual change may not be enough to avoid the climate crisis (Spangenberg, 2017). By approaching the issue of reducing meat consumption from a systemic perspective, these strategies work together to create a more comprehensive and sustainable impact, considering the interconnected nature of food systems, public attitudes,

and the various stakeholders involved. Food system changes need to be adopted to disrupt the status quo and for transformative changes (Sabherwal & O'Dell, 2024). Health and sustainability must be at the core of all decisions for system change, to support of the ecological integrity of the food system (Béné, Oosterveer, et al., 2019).

5.7.3 Flexibility as a Target

Reducers constitute a social group characterised by their flexible dietary practices and identities, offering policymakers and interventions an opportunity to leverage flexibility to promote sustainability. Researchers caution against advocating for full commitment to strict practices, as many may feel reluctant to join a group they perceive as a minority with restrictive behaviours and identities (Kurz et al., 2020). Various factors contribute to this reluctance. Joining infrastructures tied to minority identities might not attract new members, as people might feel the pressure to commit, unsure about sticking to the practice in the long-term, or fear being judged (Kurz et al., 2020). This aligns with findings from this thesis, which evidences how intergroup perceptions influences identification with vegans and maintenance of dietary changes. Researchers suggest that public messages focusing heavily on the minority identities might actually hinder efforts to promote these behaviours to a larger audience (Kurz et al., 2020). Instead, policies and interventions focusing on promoting sustainable practices should aim to make it easy for everyone to experiment with sustainable practices, by embracing flexibility to enhance a sense of inclusion and broader societal shifts.

5.8 Reflexivity, Positionality, and Culture

This thesis adopts an ontological perspective grounded in critical realism. Within this framework, reality is understood as multifaceted (Fletcher, 2017), and encompasses three levels: the empirical (people's lived experiences and perceptions), the actual (the environment where these experiences unfold), and the real (the underlying causal mechanisms guiding observed interactions and outcomes). Here, causality moves beyond the positivist perspective of association between observable events. Critical realism posits that abstract

social and psychological constructs, when grounded in context, can exert causal influence, leading to the observed events under specific conditions. Therefore, I interpreted participants' responses as reflections of what affects their experiences of reducing meat and/or dairy consumption and provided theoretical explanation of causal influences. I also acknowledged that their experiences are shaped by culture, historic, and socio-economic factors which may not reflect the actual causal influences (Fletcher, 2017). The findings from this thesis lay the groundwork for future research to explore these highlighted mechanisms.

The active and reflexive role of researchers (Braun & Clarke, 2019) highlights the significance of the researcher's lived experiences and cultural background in shaping reality. Reflecting on my journey of reducing meat and dairy consumption, the most prominent barriers I have faced during this dietary shift different from those of my participants. Cooking from scratch holds deep significance in my cultural background, reflecting culinary traditions and family values, even amidst the economic challenges that Lebanon has witnessed. Abstaining from meat and dairy is part of spiritual and cultural practices, such as on Fridays and during lent. Moreover, within my cultural context, cooking from scratch is seen as promoting both health and affordability of food. This is exemplified by dishes like 'Moujaddara' and salad consisting of rice, lentils, onion, virgin olive oil, and vegetables, which provides a well-balanced, nutritious, and at cost-effective meal. Other dishes require considerable time to prepare and cook, with the belief that the more time spent cooking, the greater the love infused into the dish. The similarities and contrasting experiences underscores the complexity of my positionality within this research, and prompted me to approach participants' reports with curiosity, striving to understand their cultural experiences and perspectives without imposing my own. They also offered a rich perspective on the barriers associated with shifting diets with less meat or dairy, and how these might differ across various cultures.

Despite these cultural disparities, it's crucial to acknowledge the potential influence of my background on suggesting practical implications rooted in cultural values, such as emphasising the social and emotional aspects of cooking, which might not be as suitable within the UK. The act of cooking carries

significant emotional weight within my Lebanese heritage, often tied to memories, traditions, and cultural identity, stemming from various socio-economic factors. For instance, Lebanon being a post-war country has perpetuated traditional gender roles within the older generation, where mothers often assumed the role of homemakers, and have further reinforced the centrality of cooking in family life. Even for working mothers, cooking remained a cherished responsibility, often shared among extended family members. Grandmothers, aunts, and other relatives would step in to assist with childcare or meal preparation, ensuring that the family's culinary traditions were upheld. While the feasibility of these implications in the UK exceeds my expertise, they offer interesting avenues for future research on cultural differences within the context of consuming less meat and dairy.

5.9 Strengths, Limitations, and Future Research Directions

The strength of my thesis lies in its comprehensive research methodology, combining both quantitative and qualitative methods to provide a nuanced understanding of the phenomenon at hand. Building upon previous research on reducing meat consumption within the COM-B framework (Graça et al., 2019), this work addressed the gap highlighted by Graça and colleagues, by examining influences from the social opportunity domain. Specifically, the exploration of meta-stereotypes in dietary behaviours and their influence on motivations represents a novel and uncharted area. The inclusion of a substantial sample size in the qualitative research phase contributes to the robustness of the findings. Moreover, the thesis stands out for its relevance, addressing a timely topic that aligns with the current global climate crisis. By delving into the intricate dynamics of dietary choices and their motivations, the thesis not only contributes to academic knowledge but also offers valuable insights applicable to real-world challenges, emphasizing its significance and practical implications.

As with any research, there are limitations to note. Firstly, results from my studies arise from using self-report measures, specifically for the behavioural and motivational measures in Chapter 3. Gathering participants' subjective accounts of their own motivations and behaviours is a popular method that aligns

with the overarching aim of this thesis: to explore perceptions and experiences related to dietary shifts towards less meat and/or dairy consumption. However, self-report measures are not without limitations, particularly regarding biases such as recall bias, response shift, and social desirability bias (Larson, 2019), whereby participants may provide answers they perceive as socially acceptable or favourable, shift their responses accordingly, or falsely recall past events. However, I ensured anonymity and confidentiality of respondents, and used indirect questions for the qualitative open-ended questions, which should reduce social desirability bias. I also used mixed methodologies, such as retrospective and open-ended questions, as well, prompting participants to think about what they expect to consume across various situations, all potentially reducing recall bias. Future research could replicate these findings by objectively assessing actual meat and dairy consumption, with well-defined dietary intake measures to quantify the dietary changes and maintenance of such changes more accurately.

Secondly, in Chapter 3, I asked participants whether they maintain their dietary changes. As previously discussed, participants varied in the clarity of their reduction goals, which may have affected the accuracy of measuring motivations to maintaining dietary changes. Refining measures for goal specificity can provide a more nuanced understanding of the maintenance of behavioural change. Furthermore, considering individual differences, such as confidence and the need to belong, could shed light into the understanding of meta-stereotypes. By addressing these facets, future research can significantly enhance the understanding of the psychological mechanisms underlying dietary choices and contribute to more effective interventions for sustainable eating habits.

Thirdly, in Chapter 2 and 4, I rely solely on qualitative surveys. Although using qualitative survey questions allows researchers to gather in-depth and nuanced perspectives from a large number of participants (Braun et al., 2020), interviews typically offer a more comprehensive and interactive approach compared to written survey questions (Malterud et al., 2016). Interviews allow researchers to probe, clarify, and explore participants' responses in real-time, fostering a dynamic dialogue that can uncover underlying motivations, contradictions, or nuances. Additionally, the flexibility inherent in interviews permits researchers

to adapt questions, delve deeper into specific topics, and explore unexpected insights that might not emerge through standardized survey questions. However, interviews can introduce biases such as social desirability bias, and confirmation bias might occur if interviewers unintentionally seek information in a way that aligns with their preconceived notions or expectations.

Fourthly, in Chapter 4, participants may have been primed to talk about stereotypes and meta-stereotypes as barriers after completing the closed self-reported measures on stereotypes and meta-stereotypes. To reduce effects of priming, I asked participants through a three-part question about barriers to reducing meat and dairy consumption more generally, before asking specifically about stereotypes and meta-stereotypes. I also asked about stereotypes and meta-stereotypes in hypothetical scenarios, which can facilitate discussions on sensitive or complex topics, such as admitting other people's influence on self, encouraging participants to express opinions more freely. Nonetheless, future research could vary the qualitative methods. For example, rather than solely relying on surveys for qualitative research, interviews, focus groups, and case studies offer more in-depth accounts of people's experiences of reducing meat and dairy consumption, as well as experiences of stereotypes and meta-stereotypes of vegans.

Finally, regarding sampling methods, I sampled environmentally motivated reducers in Chapter 2, yet did not follow through with sampling reducers with environmental motives in the next chapters. I also focused on women in Chapters 3 and 4. Therefore, findings from my research do not reflect the diversity and proportions of the entire population, hindering the generalisability of these findings. To enhance the generalisability of my findings, future studies should aim to replicate the current research with men, recognising that the reduction of meat and/or dairy intake may be driven by somewhat different mechanisms among men than it is among women. Given the association between gender conformity and meat consumption (Rosenfeld & Tomiyama, 2021a), future research could delve into gender differences in the processes examined in this thesis, contributing valuable insights to sustainability efforts in eating patterns.

Touching on generalisability of the findings from this thesis, it is important to note that meta-stereotype processes could vary significantly based on socioeconomic differences. While the findings from this thesis can be generalised across female reducers from middle and working-class backgrounds, they may not accurately represent women from higher social status. For instance, women from higher socioeconomic classes may disidentify with vegans or veganism, perceiving it as a marker of the middle class. Moreover, practical barriers to adopting sustainable diets may also differ across socioeconomic statuses, with some unique to certain classes and others common across all social strata. For example, in a study exploring the reasons behind parents' choices of healthy and sustainable foods for their children, researchers found that higher-income parents encounter more barriers to adopting sustainable diets, such as a lack of knowledge and confidence in making sustainable choices, while both higher and lower-income parents lack the time to prepare plant-based meals (Vos et al., 2022). This underscores the importance of considering socioeconomic differences that I have not explored in my thesis.

5.10 Implications for Sustainability and Health Research

The current research thesis holds significant implications for promoting sustainable dietary choices. Reducing meat and dairy consumption is essential to mitigate climate degradation (Willett et al., 2019), specifically in western societies (Stoll-Kleemann & Schmidt, 2017). Successfully promoting and supporting a reduced meat and dairy diet requires the understanding of the psychological factors that underpin individual consumption of these foods. Findings across chapters highlight an array of psychological factors that influence motivation and behaviour, and highlight how individual-level action are intertwined within the food environmental contexts, social and physical. Reducing meat and dairy consumption is best conceptualised in a complex system approach, referring to when socioeconomic, cultural, and environmental factors interact with social, behavioural, and biological factors, and produce health and sustainability outcomes across the population (Sniehotta et al., 2017). Systems such as educational and public health and sustainability policies contribute to food environment and food norms. Therefore, the future for health and sustainability research on meat and dairy reduction must integrate both

individual level approaches and system level approaches as interdependent, focusing on sustainable and healthy plant-based diets as the norm.

The findings of my research bear significant implications for broader sustainability research, particularly in the context of dietary choices and their impact on the environment. Findings from Chapter 3 and 4 evidence polarisation between vegan and omnivore groups. When researchers and policymakers continually emphasize differences between groups by labelling them, it may exacerbate divisions. Instead, fostering a shared purpose among all dietary groups, such as addressing climate change as a mutual concern regardless of dietary preferences, all while considering the array of social identities that potentially hinder or promote health and sustainable behaviours, could help alleviate tensions between vegans and omnivores. By shifting the focus from social categorisation to a collective and shared objective, the potential for unity may increase. Recognising the commonality of the problem and promoting collective action toward sustainable practices across diverse dietary lifestyles emerges as the imperative way forward for mitigating environmental challenges.

5.11 Conclusion

This thesis demonstrated how people perceive the challenges of dietary change towards less meat and/or dairy consumption, and how they (and others) perceive vegans. I utilised the lens of various theories. The findings provide initial evidence for dietary polarisation, where vegans who hold stronger beliefs about omnivores negatively perceiving their ingroup also held stronger negative regard of omnivores. I also illustrated the interplay of motivational forces in behaviours such as that of desires, habits, identities, and social norms. Further, this thesis offers insights into the dynamics of omnivore-vegan polarisation through the lens of reducers, and how their perceptions of such polarisations influence them and their motivation to maintain their dietary changes. Consuming meat and dairy foods contribute to the climate crisis, and is a challenge that all individuals, specifically those in the high-income countries, need to consider and tackle, regardless of their membership of dietary groups.

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