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Understanding values and belief changes in relation to food waste behaviours

A report commissioned by Zero Waste
Scotland

September 2025

**ZERO
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Delivery Team

The project team comprised a number of academics and researchers from different Universities across the UK:

- Dr Christian Reynolds, City St George's, University of London.
- Dr Luiza Toma, SRUC.
- Dr Jack Pickering, City St George's, University of London.
- Angelica Nahalka, SRUC.
- Dr Rosanna Morrison, SRUC.
- Dr Katy Tapper, City St George's, University of London.
- Dr Bethan Thompson, SRUC.

Dr Jack Pickering was responsible for coordinating and conducting this research, as well as drafting this report. Dr Christian Reynolds and Dr Luiza Toma offered administrative support and project guidance. Angelica Nahalka assisted with data collection and transcription and contributed to the analysis process. Dr Rosanna Morrison and Dr Bethan Thompson completed the REA. Dr Katy Tapper and Dr Bethan Thompson led the development of conceptual models. Dr Andreea Bocioaga oversaw the project from Zero Waste Scotland. The report was edited and finished by the entire team and Zero Waste Scotland staff.

Regular project meetings were held with Zero Waste Scotland research staff to provide updates on project progress and decision-making.

1 Executive Summary

Background and approach

Food waste is a key environmental policy priority for the Scottish Government, and household food waste contributes a significant proportion of our emissions. Behavioural interventions have proved challenging to implement, and there have been recent suggestions that this is due to a focus on cognitive aspects of behaviour rather than on belief-driven and emotional aspects of behaviour. There may also be wider beliefs and systems of belief which have an impact on food waste behaviour and engagement with food waste interventions. This is the motivation behind this study.

The working definitions of relevant terms such as beliefs, values, and attitudes have been given in Table 3.1 in the main report. A Rapid Evidence Assessment (REA) was conducted to assess the breadth of research into beliefs and belief change across disciplines. A detailed description of the methodology (databases used, search terms, disciplines and number of initial papers returned) is included in the main text. Particularly important ideas and concepts that emerged from the REA literature reviewed in depth included:

1. Crises of belief (significant events which challenge previously held beliefs)
2. Social milieu, community, and personal identity as a determining factor in belief and belief change.
3. Generational shifts in beliefs and values.
4. The system of values set out by Schwartz¹ et al was adopted by the project team as an efficient way to compare changes in values across different situations.

In addition to the concepts set out above, the authors considered the following as they were relevant to the research:

¹ Schwartz, S.H. et al. (2012) Refining the theory of basic individual values. *Journal of Personality and Social Psychology* 103(4), pp. 663–688.

5. Thrift and Frugality: These values are different, but both aim to limit consumption and are important parts of how people think about waste and sustainability. They can be linked to a number of Schwartz values.

Research questions

1. How do values and beliefs relate to relevant consumer behaviour?
2. How do values and beliefs related to food waste develop?
3. How do values and beliefs related to food waste change over time?
4. How do thrift and frugality relate to food waste beliefs?

Methods and data collection

An online questionnaire was used to recruit and screen participants and to provide demographic information about them. The questionnaire was run by a third party (Dynata). 74 participants completed semi-structured interviews and were reimbursed, 3 were excluded from the analysis for technical reasons. The full responses are listed in a spreadsheet available from the project team on request. A table summarising the demographic details of the sample can be found in Tables 5.1-5.9 in the full report. The interview guide was designed with considerations taken to prevent a common problem in food waste research, associated with desirability biases around appropriate food waste behaviour². Questions concerned with the detail of participants' lives and beliefs were included in an early section. Food waste and sustainability specific questions and probing around food waste were saved until the final section. To analyse the interview transcripts, inductive and deductive processes were used, using NVIVO. Inductive analysis was used to identify different kinds of events and processes which could contribute to belief change. Deductive analysis, informed by the Schwartz values were used to identify instances of belief change and to identify particular beliefs. Matrix coding was then used to cross reference events and processes with value changes.

² Schanes, K. et al. (2018) Food waste matters - A systematic review of household food waste practices and their policy implications. *Journal of Cleaner Production* 182, pp. 978–991.

Key findings

Table 1: Research questions and relevant findings

Research Question	Relevant findings
How do values and beliefs relate to relevant consumer behaviour?	Sustainability beliefs are affected by the changing environment. Participants notice and sometimes change their behaviour in response to environmental issues they observe in their own lives e.g. severe weather events affecting people in Scotland.
How do values and beliefs related to food waste develop?	Childhood experiences have a significant role in forming the moral approach that people take to food waste in later life.
How do values and beliefs related to food waste change over time?	Food waste-associated values may change in response to particular transitions in the life course, e.g. when children leave home, and provisioning practices have to be re-evaluated. Some people may re-evaluate their food waste-related beliefs based on significant environmental or social events.
How does thrift/frugality relate to food waste beliefs?	People often associate thrift and frugality with a pre-consumerist perspective on food and food waste e.g. post war rationing. These values embody an idealised perspective on food and food waste and are at odds with the current narratives of consumption – e.g. the notion that previous generation were more frugal and implicitly less wasteful. Thrift and frugality are thus values that seem aspirational regarding food waste behaviours.

Conclusion and recommendations

This research explored how individuals' values and beliefs change over time and the relationship between changes in values and beliefs and perspectives on food waste. The study also considered how individuals reflected on food waste in the context of wider environmental

issues and the role of thrift and frugality in shaping people's values and beliefs about food waste.

Missing connections between food waste and the climate crisis/emissions:

- Most participants accepted anthropogenic global warming and accepted the need to do something about it, but direct explicit associations between household food waste and emissions were rare.
- It was similarly rare for participants to connect food waste to global emissions. Food waste was generally considered a waste treatment problem.
- Participants displayed some understanding of systems-level thinking related to other topics like food miles.
- Policy-informed approaches to food waste are based on the idea that food waste results in wasted emissions.
- Communications that make this link explicit could have success in changing food waste beliefs and behaviour, based on prior engagement of participants with ideas in relation to other topics i.e. food miles.

Life course transitions emerged as the most significant influence and cause of change in values and beliefs in this report, echoing psychological research on belief change.

- Life course transitions are periods of change from one period of relatively fixed relationships and responsibilities to another.
- In this case, the transition to retirement and the transition from teenage/student years to independent adulthood appeared as the most significant in terms of belief change. The transition to retirement/children moving out may be more impactful in terms of avoiding food waste because of the significance of the change in provisioning involved.
- These transitional periods offer a significant opportunity for policy, campaigns, and research to take advantage of belief change processes which are already in progress.
- This offers opportunities for updating or contributing to consumer segmentation. This report shows that there may be some value in approaching segmentation with a view to taking into account life course transition periods in which values and beliefs relevant

to food waste may change. These periods are similar to the segmentation system proposed by Borg et al³. Key themes for communications strategies for specific groups include:

- A move towards self-direction as a focus for communications aimed at age groups 45-70 years old.
- Thrift and achievement as a combined focus for communications aimed at young adult groups (18-30).
- Subjectively unpleasant or traumatic life experiences around food may restrict engagement with food waste reduction practices.
- Negative relationships with food due to events in childhood or illness seemed to be fairly common, and they resulted in food waste avoidance being deprioritised. Values informed by life experience and situational priorities also mean that food waste avoidance may be deprioritised. This could be taken into account in segmentation efforts directly.

This report offers insight into the role of Thrift and Frugality as a separate set of related values specifically oriented towards limiting consumption in everyday life.

- Thrift and Frugality are deeply involved in regulating other values such as achievement and hedonism in terms of food and consumption behaviour.
- Thrift and Frugality operate as key parts of belief systems where the role of humans in the environment is concerned, making it additionally meaningful for food waste reduction.
- It might be possible to target consumers motivated by thrift and frugality differently.
- Thrifty and Frugal consumers have meaningfully different approaches to consumption, and this means they may be receptive to different messaging content and styles. Further quantitative research could establish criteria for segmentation research.

³ Borg, K., Boulet, M., Karunasena, G. and Pearson, D. (2022). Segmenting households based on food waste behaviours and waste audit outcomes: Introducing Over Providers, Under Planners and Considerate Planners. *Journal of Cleaner Production*, 351, p.131589. doi:<https://doi.org/10.1016/j.jclepro.2022.131589>.

2 Introduction

2.1 Background and rationale

Food is a key contributor to the overall environmental footprint of Scotland through impacts generated in different areas, from production to distribution, consumption and waste management⁴. The Scottish Waste Environmental Footprint Tool shows that household food waste is the largest waste stream by weight (436,259t). Aside from emissions-based impacts, household food waste also has significant negative environmental impacts on land use and biodiversity⁵. It was estimated that in 2021/22, 6.4 million tonnes of food (and drink) waste was generated from UK households. This equates to 95 kg per person per year, 227 kg per household per year, or 341 kg per 4 person household⁶. Efforts to address the scale of this issue have led governments and organisations to try to change behaviours at the household level but this has proven to be a significant challenge.

2.2 Challenges to implementing behavioural interventions

There are hundreds of potential interventions to reduce food waste. However, as evidence on what works best is still developing, few legislative approaches have been implemented, and policymakers seeking to tackle the issue often have to act with limited knowledge⁷. Current food waste reduction programmes typically aim to change participants' behaviour by providing individuals with a variety of behavioural solutions to help reduce their food waste, such as meal planning approaches, food storage strategies, and recipes that help with leftover food use⁸. More recent findings suggest that interventions aimed at changing these behaviours

⁴ Circularity Gap Report Scotland (2023) [online] Available at: <https://www.circularity-gap.world/scotland>.

⁵ Zero Waste Scotland (2023) Scottish Waste Environmental Footprint Tool. Available at <https://cdn.zerowastescotland.org.uk/managed-downloads/mf-melt3roo-1716290167d>

⁶ WRAP. (2023). Courtauld Commitment 2030 Milestone Report 2023. [online] Available at: <https://www.wrap.ngo/sites/default/files/2023-11/WRAP-Courtauld-Commitment-2030-Milestone-Report-v2.0.pdf>

⁷ Bradshaw, C. and Wentworth, J. (2024). Food Waste. [online] POSTBrief. Available at: <https://researchbriefings.files.parliament.uk/documents/POST-PB-0060/POST-PB-0060.pdf>.

⁸ Boulet, M., Stott, A.W. and Kneebone, S. (2023). Which behaviours matter? Prioritising food waste reduction behaviours for targeted policy and program approaches. *Journal of Environmental Management*, 345, pp.118668–118668.

alone might lead to mitigation overload, a situation in which participants exposed to continuous messages become unsure about how to act in the most appropriate way and feel like they can less successfully engage in effective change⁹.

Behaviour change studies on food waste reduction have mostly focused on cognitive aspects of the selection and consumption of food (e.g. decision-making surrounding food activities). However, it might be helpful to move beyond cognitive aspects of behaviour, as emotional appeals can also be effective for reducing food waste¹⁰. Moreover, research has found that factors like values, beliefs and attitudes strongly influence people's engagement with food waste interventions¹¹. Most food decisions and activities are made in the context of complex everyday lives alongside competing considerations. This indicates that understanding people's values and beliefs more widely as a way to understand the contexts in which food decisions are made could be useful in developing effective food waste interventions that consider the effects of these elements alongside the cognitive aspects. More specifically, we think it is crucial to explore how the wider beliefs held by individuals integrate with and affect beliefs, values, and attitudes specifically relating to food and food waste.

This research aims to explore how individuals' values and beliefs change over time and how these changes impact values and beliefs about food waste. The study also considers how individuals frame their understanding of food waste in the context of wider environmental issues and the role of thrift and frugality in shaping values and beliefs about food waste.

⁹ Andrews, T.M., Kline, R., Krupnikov, Y. and Ryan, J.B. (2022). Too many ways to help: How to promote climate change mitigation behaviors. *Journal of Environmental Psychology*, 81, p.101806. doi:<https://doi.org/10.1016/j.jenvp.2022.101806>

¹⁰ Septianto, F., Kemper, J.A. and Northey, G. (2020). Thanks, but no thanks: The influence of gratitude on consumer awareness of food waste. *Journal of Cleaner Production*, 258, p.120591. doi:<https://doi.org/10.1016/j.jclepro.2020.120591>.

¹¹ Thondhlana, G. and Hlatshwayo, T.N. (2018). Pro-Environmental Behaviour in Student Residences at Rhodes University, South Africa. *Sustainability*, 10(8), p.2746. doi:<https://doi.org/10.3390/su10082746>.

3 Conceptual approach

3.1 Research rationale

Food waste is a significant contributor to climate change as emissions and resources used to produce food are wasted along with food when it becomes waste¹². Households are responsible for a significant proportion of this waste¹³. Reducing household food waste has proven challenging for a number of reasons including a lack of knowledge regarding food waste reduction behaviours^{14,15}. The wide range of household food waste reduction policies currently used are based on behavioural approaches and cognition¹⁶ which may also be overloading consumers, leading to confusion and a lack of change¹⁷. Recent studies have suggested that understanding the dynamics between a wide range of beliefs could be helpful for designing effective policy interventions^{18,19}. For example, consumers may have beliefs about food waste that do not align with the scientific consensus. Their behaviour may be informed by fundamental beliefs such as the need to be “good providers” among other things and these may be related to wider systems of belief. How these beliefs change over time and relate to food waste behaviour more generally requires further study²⁰. In this study we aim to

¹² Quested, T.E.; Parry, A.D.; Easteal, S.; Swannell, R. Food and drink waste from households in the UK. *Nutr. Bull.* 2011, 36, 460–467.

¹³ Schanes, K. et al. 2018. Food waste matters - A systematic review of household food waste practices and their policy implications. *Journal of Cleaner Production* 182, pp. 978–991.

¹⁴ WRAP. (2023). Courtauld Commitment 2030 Milestone Report 2023. [online] Available at: <https://www.wrap.ngo/sites/default/files/2023-11/WRAP-Courtauld-Commitment-2030-Milestone-Report-v2.0.pdf>

¹⁵ Bradshaw, C. and Wentworth, J. (2024). Food Waste. [online] POSTBrief. Available at: <https://researchbriefings.files.parliament.uk/documents/POST-PB-0060/POST-PB-0060.pdf>.

¹⁶ Boulet, M., Stott, A.W. and Kneebone, S. (2023). Which behaviours matter? Prioritising food waste reduction behaviours for targeted policy and program approaches. *Journal of Environmental Management*, 345, pp.118668–118668.

¹⁷ Andrews, T.M., Kline, R., Krupnikov, Y. and Ryan, J.B. (2022). Too many ways to help: How to promote climate change mitigation behaviors. *Journal of Environmental Psychology*, 81, p.101806.

¹⁸ Thondhlana, G. and Hlatshwayo, T.N. (2018). Pro-Environmental Behaviour in Student Residences at Rhodes University, South Africa. *Sustainability*, 10(8), p.2746. doi:<https://doi.org/10.3390/su10082746>.

¹⁹ Septianto, F., Kemper, J.A. and Northey, G. (2020). Thanks, but no thanks: The influence of gratitude on consumer awareness of food waste. *Journal of Cleaner Production*, 258, p.120591. doi:<https://doi.org/10.1016/j.jclepro.2020.120591>.

²⁰ Borg, K., Boulet, M., Karunasena, G. and Pearson, D. (2022). Segmenting households based on food waste behaviours and waste audit outcomes: Introducing Over Providers, Under Planners and Considerate Planners. *Journal of Cleaner Production*, 351, p.131589. doi:<https://doi.org/10.1016/j.jclepro.2022.131589>.

explore this dynamic between values, beliefs, changes of beliefs and food waste behaviour in more depth.

3.2 Rapid Evidence Assessment (REA)

To develop an overview understanding of the evidence relating to values, beliefs and changes as well as the relationship between these and food waste, we conducted a Rapid Evidence Assessment (REA). The Rapid Evidence Assessment was explicitly undertaken to understand research into beliefs and belief change across different disciplinary perspectives. A detailed description of the methodology (databases used, search terms, disciplines, and number of initial papers returned) is included in Appendix 1. While the literature on how food waste attitudes and intentions affect behaviour is grounded in the psychological literature²¹, there is a range of other literature which addresses belief change processes.

The abstracts of papers collected through the REA were reviewed for relevant information, and 30 documents were selected for in-depth reading. This list can be found in Appendix 2. Additional literature was identified in a “snowball” fashion from these 30 documents, as well as from the personal knowledge and databases of the authors. This can be found in the references section of this report. This additional literature was introduced and examined once the REA was completed and reviewed.

Particularly important ideas and concepts that emerged from the REA literature reviewed in depth included:

- Crises of belief (events which challenge previously held beliefs)
- Social milieu and communities are determining factors in belief and belief change
- Generational shifts in values and beliefs
- Various systems of categorising beliefs and their relationships to sustainability behaviours
- The role of personal identity in setting belief

These areas and other relevant concepts and theories are discussed in section 3.1.

As a result, the following research questions were proposed:

²¹ Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), pp.179–211. doi:[https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T).

1. How do values and beliefs relate to relevant consumer behaviour?
2. How do values and beliefs related to food waste develop?
3. How do values and beliefs related to food waste change over time?
4. How do thrift and frugality relate to food waste beliefs?

3.3 Understanding values and beliefs

3.3.1 Working definitions

Concepts like beliefs, morals and values have different discipline-specific meanings. The project was approached as interdisciplinary, meaning that definitions of concepts and terms of reference were not taken from one discipline. Similarly, no discipline-specific ontologies or epistemologies were adopted for the research process. Instead, approaches and concepts were used that worked with a loosely framed constructivist qualitative approach to social science research. Care was taken to avoid obvious clashes between concepts and assumptions generally. However, the lack of a single frame of reference in disciplinary terms meant that defining concepts like values and beliefs was difficult. Elements for this project came from various disciplines such as psychology, sustainability, philosophy, anthropology, sociology which all have different ontologies, methods and approaches to the same topics. This decision was taken as the topic of beliefs may have been approached in different ways with different insights from each, in different disciplines. The drawback of this decision was that there was some initial uncertainty about how different approaches and concepts could be used within this report. This could have been improved with reference and adherence to definitions from a single discipline, or multiple mutually intelligible disciplines.

To ensure some consistency of approach, we have provided our working definitions in Table 3.1. Please see Table 3.1 and the papers listed in Appendix 2 for more information.

Table 3.1 Summary of working definitions of relevant concepts

Term / Concept	Definition
Belief	A normative (relating to social norms) understanding of a state of affairs (or how something should be). Generally expressed in relation to a wide range of subjects.

Values	A normative understanding of personal conduct or practices. Generally expressed in relation to more specific subjects concerning social behaviour and expectations.
Attitudes	Beliefs about specific social, political, economic or cultural issues.
Morals	Socially determined abstract ideals concerning ethical conduct, may be interpersonal or more general.

Across the multi-disciplinary literature on values and beliefs, a wide range of theoretical systems are used to assess values and beliefs. These systems often consider values and beliefs in relation to relevant topics like specific environmental issues such as food waste. For our purposes, which is to explore the dynamics between beliefs and beliefs changes such systems are too limited. system of categorising beliefs is needed that can describe a full range of possible values, even if this system is not directly constructed in relation to food waste.

The most appropriate system of values that meets this description is the Schwartz theory of basic universal values²². This theory consists of 10 values, aligned with specific motivational goals, further subdividable into 19 values. These values are listed in Table 3.2. Each of these values can be placed on a complete circular motivational continuum, ordered by a nested set of conceptual divisions:

1. Growth (anxiety-free) vs Self-Protection (anxiety-avoidance)
2. Social Focus vs Personal Focus.
3. Self-Transcendence – Openness to Change – Self-enhancement – Conservation

These are set out in Table 3.2. Each of these corresponds to particular places on the circular continuum and so can be used to place and compare values. The benefit of this approach is that it is trans-situational and the relationships and contrasts between values can be compared. It allows for a standardised description of the important parts of the belief system of an individual, without reference to an external frame. Any changes in values therefore can also be described in terms of the shifting motivational elements that determine them. This provides a

²² Schwartz, S.H. et al. (2012) Refining the theory of basic individual values. *Journal of Personality and Social Psychology* 103(4), pp. 663–688.

lot of flexibility and utility when discussing values and value changes independent of food waste behaviours.

Table 3.2: Schwartz Values (adapted from Schwartz et al, 2012)

Values	Definitions
Self-direction-Thought	Freedom to cultivate one's own ideas and abilities
Security-Societal	Safety and stability in the wider society
Tradition	Maintaining and preserving cultural, family, or religious traditions
Conformity-rules	Compliance with rules, laws, and formal obligations
Conformity-Interpersonal	Avoidance of upsetting or harming other people.
Humility	Recognizing one's insignificance in the larger scheme of things
Benevolence-Dependability	Being a reliable and trustworthy member of the ingroup
Benevolence-caring	Devotion to the welfare of ingroup members
Universalism-Concern	Commitment to equality, justice, and protection for all people
Universalism-Nature	Preservation of the natural environment
Universalism-Tolerance	Acceptance and understanding of those who are different from oneself
Self direction-Action	Autonomy of action.
Stimulation	Excitement, novelty, and change.
Hedonism	Pleasure and sensuous gratification.
Achievement	Success according to social standards.
Power-dominance	Power through exercising control over people
Power-resources	Power through control of material and social resources

Face	Security and power through maintaining one's public image and avoiding humiliation
Security-Personal	Safety in one's immediate environment

While this framework is useful for understanding and categorising values in relation to each other, a range of different elements of belief may be relevant to food waste which are not captured by this system of values. Religious beliefs and politically informed worldviews and ideologies may also have specific features that cannot be reduced to positions on the continuums described here. This research is intended to be exploratory, so efforts have been taken to leave space for such elements to emerge in the analysis through the choice of specific methodologies and analytical approaches.

The analysis was framed by this understanding of values as a way to categorise and distinguish between different values that individuals might hold. However, the discussion and findings of this report translate these values into more easily understood terms and terminology – which is why these categories are not explicitly used in the report. This was done to improve the readability of the report for non-academic audiences.

The following section will explore how different ideas and concepts were operationalised and included in the conceptual framework for this research.

4 Understanding value and beliefs changes

The major challenge in considering relevant concepts for this project involves finding a way to address changes in values and beliefs rather than addressing values and beliefs as static and explicitly related to the issue at hand. There is a wealth of literature that attempts to use attitudes and values to explain food waste behaviours^{23,24}, but little on how these beliefs change over time. This body of research on beliefs is largely focussed on the individual as a rational actor that can be reached through messaging and information but this often overlooks the dynamic nature of beliefs and values. The following section outlines different approaches to understanding belief changes over time.

4.1 Crisis of belief, life course changes and other events

Crises of belief (COBs) are a prominent cause of changes in values and beliefs^{25,26,27}. The study of COBs originates in the study of religious conversion, but they have been explored as drivers of change in other areas. Generally, they refer to specific adverse or traumatic events or processes in an individual's life that lead them to question existing beliefs. Many people endure such things without questioning their beliefs, meaning that to identify a COB, a stressor or trauma, the questioning or change in belief response is needed. Life course changes such as becoming a parent, retirement, moving into adulthood and full-time employment may all be

²³ Keegan, E. and Breadsell, J.K. (2021) Food waste and social practices in Australian households. *Sustainability (Switzerland)* 13(6).

²⁴ Schanes, K. et al. (2018) Food waste matters - A systematic review of household food waste practices and their policy implications. *Journal of Cleaner Production* 182, pp. 978–991.

²⁵ Snook, D.W. et al. (2023) When rock bottom rocks your world: Crisis of belief as a catalyst for change. *Social and Personality Psychology Compass* 17(3), pp. 1–12.

²⁶ Heddy, B.C. et al. (2022) The moral side of the climate crisis: the effect of moral conviction on learning about climate change. *Educational and Developmental Psychologist* 39(1), pp. 58–69. Available at: <https://doi.org/10.1080/20590776.2021.2011203>.

²⁷ Akaliyski, P. et al. (2023) Values in Crisis: Societal Value Change under Existential Insecurity. *Social Indicators Research* (0123456789). Available at: <https://doi.org/10.1007/s11205-023-03226-2>.

triggering events for changes in belief; there is evidence for this in the collected literature from the Rapid Evidence Assessment^{28,29}. In addition to this, there is evidence of generational shifts in Schwartz values within cultures^{30,31}.

4.2 Group membership and identity

The literature reviewed as part of the REA raised the possibility that social group membership and identity may be essential factors in understanding belief change. Ingroup identities can predict beliefs, but the compatibility of different identities a person may hold is often influential in processes of change. Different identities may value things differently, and it is easy to understand how a person may change group membership and/or their values, based on the need to reconcile these orientations. Dissonance theory³², for example, shows that the difficulty of maintaining logical contradictions between beliefs and actions may result in behaviour change^{33,34}. More recent alternative explanations focus on resolving emotional states in conflicts between inconsistent beliefs, which affect changes to action³⁵. This would appear to be an important potential mechanism for change in food waste beliefs rooted in values and beliefs, as suggested by prior research³⁶.

²⁸ Ali, D.S. et al. (2013) 'I Became a Mom': Identity Changes in Mothers Receiving Public Assistance. *Journal of Social Service Research* 39(5), pp. 587–605.

²⁹ Voorhees, H.L. (2023) "I Was Literally Just Not Myself": How Chronic Pain Changes Multiple Frames of Identity. *Health Communication* 38(8), pp. 1641–1653. Available at: <https://doi.org/10.1080/10410236.2022.2025702>.

³⁰ Marcus, J. et al. (2017) Not So "Traditional" Anymore? Generational Shifts on Schwartz Values in Turkey. *Journal of Cross-Cultural Psychology* 48(1), pp. 58–74.

³¹ Alteneijj, E. (2023) Value changes in gender roles: Perspectives from three generations of Emirati women. *Cogent Social Sciences* 9(1). Available at: <https://doi.org/10.1080/23311886.2023.2184899>.

³² Festinger, L., Riecken, H. W., & Schachter, S. (1957). *When prophecy fails*. University of Minnesota Press. <https://doi.org/10.1037/10030-000>.

³³ Barbarossa, C. et al. (2015) A self-identity based model of electric car adoption intention : A cross-cultural comparative study. *Journal of Environmental Psychology* 42, pp. 149–160.

³⁴ Snook, D.W. et al. (2023) When rock bottom rocks your world: Crisis of belief as a catalyst for change. *Social and Personality Psychology Compass* 17(3), pp. 1–12.

³⁵ Sauvayre, R. (2017) The rationality of belief change and the unexpected effects of a conflict of values. *Rationality and Society* 29(3), pp. 298–321.

³⁶ Thondhlana, G. and Hlatshwayo, T.N. (2018). Pro-Environmental Behaviour in Student Residences at Rhodes University, South Africa. *Sustainability*, 10(8), p.2746. doi:<https://doi.org/10.3390/su10082746>.

4.3 Thrift and frugality

Household food waste has in the past been associated with irresponsibility and inefficient management of household resources³⁷. Conversely, efficiency in household management is associated with thrift and frugality³⁸. Thrift and frugality are associated values because they share a clear and broad behavioural goal: the restriction of consumption.

Evans³⁹ theorises thrift and frugality as social practices, including the differing underlying motivations of the practices. Thrift is defined as being motivated by extrinsic purposes (reducing consumption for financial reason) and frugality is defined as being motivated by intrinsic purposes (reducing consumption as a guiding ethical principle). For the purposes of this research, thrift and frugality are treated as one value in most cases because they relate to consumption and sustainability in the same way, as stated above. The role of thrift and frugality in shaping consumption patterns has also long been recognised^{40,41} and these concepts have been used more recently to advance and promote sustainable consumption or voluntary reductions in consumption.

³⁷ Evans, D. (2011) Blaming the consumer - once again: The social and material contexts of everyday food waste practices in some English households. *Critical Public Health* 21(4), pp. 429–440.

³⁸ Evans, D. (2011). Thrifty, green or frugal: Reflections on sustainable consumption in a changing economic climate. *Geoforum* 42(5), pp. 550–557.

³⁹ *ibid*

⁴⁰ Lastovicka, J. L., Bettencourt, L. A., Hughner, R. S., & Kuntze, R. J. (1999) Lifestyle of the Tight and Frugal: Theory and Measurement. *Journal of Consumer Research*, 26(1), 85–98. <https://doi.org/10.1086/209552>.

⁴¹ Evans, D. (2011). Thrifty, green or frugal: Reflections on sustainable consumption in a changing economic climate. *Geoforum* 42(5), pp. 550–557.

5 Methodological approach

5.1 Research design

This research used semi-structured interviews conducted remotely. This method allows for flexible discussion around core questions, and the remote element allows a geographically dispersed research team to interview participants living exclusively in Scotland.

5.2 Sampling and recruitment

An online questionnaire was used to recruit and screen participants and to provide some initial demographic information about them. The questionnaire/survey was hosted and administered by a third party. It was framed in such a way that completion was a prerequisite for participation, and that it demonstrated an interest in taking part in an interview. This allowed email addresses and phone numbers of potential participants to be collected for further contact. A £60 incentive was offered for completion of the interview, paid after completion of the interview. Once the email addresses and phone numbers had been supplied, we used them to contact potential participants to arrange remote interviews.

In the design of this questionnaire, consideration was given to issues in participants' lives that may make their beliefs around environmental and food waste-related issues particularly distinctive. As such, one question asked the participant to agree with statements that described their life situation. These included things that may strongly influence the relationship of the participant with food and food waste, such as mobility issues, disabilities, caring responsibilities and more. A diverse sample was desirable, but diversity in the sample was lower than anticipated due to time constraints.

Direct participant engagement with food waste as an environmental issue was assessed, along with related environmental and political issues, and participants were also able to state their personal environmental concerns in open-ended questions. The answers given to these questions and the demographic questions are not used for analysis but to inform the conduct of the interviews and to provide background knowledge about the participant before it begins. The questionnaire was reviewed by Zero Waste Scotland staff and edited based on their comments, before it was finalised and approved for use.

5.3 Questionnaire response summaries /

Sample details

Below are tables summarising key demographic information about the sample and auxiliary questions. It is worth noting that while 74 participants completed an interview and were reimbursed, 3 were excluded from the analysis for technical reasons.

Table 5.1 Key demographic information (gender)

Gender	Number of participants
Male	41
Female	30
Total	71

Table 5.2 Key demographic information (age)

Age	Number of participants
18-29	7
30-39	5
40-49	11
50-59	12
60-69	23
70-79	12
80-89	1
Total	71

Table 5.3 Key demographic information (household size)

Household Size	Number of participants
1	17
2	37
3	8
4	8
5	0
More than 5	1
Total	71

Table 5.4 Key demographic information (minority ethnic background)

Minority Ethnic Background	Number of participants
Yes	4
No	67
Total	71

Table 5.5 Key demographic information (problems with mobility)

Problems With Mobility	Number of participants
Yes	8
No	63
Total	71

Table 5.6 Key demographic information (retired)

Retired	Number of participants
Yes	24
No	47
Total	71

Table 5.7 Household Composition

Household Composition	Number of participants
With partner/spouse	26
With partner/spouse and children	13
With partner/spouse and other adults	0
With other adults (including parents)	6
With other adults and children (your own or someone else's)	6
With children, no partner/spouse	4
Alone	16
Total	71

Table 5.8 Views on Food Waste

Views on food waste	Number of participants
Food waste is a serious problem and I take specific actions to reduce the amount of food waste my household produces.	36
Food waste is a problem and I try to do some things to reduce food waste in my household.	25

I don't like food waste, but I don't have enough time or energy to do much about it.	1
Food waste is a problem, but my food waste is insignificant in comparison with other sources.	9
Food waste is a problem, but it's not my problem to solve it.	0
Food waste is not a problem	0
Total	71

Table 5.9 Household income of participants

Total household pre-tax income	Number of participants
£0-20000	9
£20000-40000	24
£40000-60000	21
£60000-80000	6
Above £80000	10
Prefer not to answer	1
Total	71

5.4 Interview guide and conduct

An interview guide was drawn up based on the conceptual framework described previously and the areas of interest emerging from the literature. Care was taken to prevent a common issue found in studies of food waste. This is a problem associated with the fact that food waste and waste in general is a commonly moralised topic. This issue appears to be a topic-specific

desirability bias, which has been noted in numerous studies⁴². To avoid this issue, questions concerned with the details of participants' lives and beliefs were included in an early section. Food waste and sustainability-specific questions and probing around food waste were saved until the final section. A middle section dealt with questions addressing the relationships between beliefs, social groups and society at large. Conflicts between self and others, changes in group membership, memorable changes in beliefs, and key interests and identities were all used as core ideas to generate questions. The final section addressed food, food waste, and broader food sustainability. If a participant did not naturally introduce food waste during the interview, the topic was left till this final section. This interview guide was reviewed by Zero Waste Scotland staff and edited based on their comments and discussion.

Ethical approval was gained from both SRUC and City St George's, University of London before the data collection took place. Additionally, legal agreements and data sharing arrangements were confirmed by these parties, Zero Waste Scotland, and the third party responsible for administering the survey before the research began. An information sheet and consent form in one document were sent to participants before the interview slot was agreed upon and signed before they participated in the research. This document was approved beforehand by the ethical review processes.

In total, 166 people were contacted by email. Of these, 74 participants completed an interview between 1st March 2024 and 31st March 2024. Three participants had to be removed due to technical issues with the interview recordings. The remaining participants were contacted by phone and sent follow-up emails numerous times but were excluded and replaced with potential participants sourced from questionnaire completers due to the short time frame for the completion of the research.

Two researchers conducted the interviews, Jack Pickering and Angelica Nahalka. Remote videoconferencing (Zoom, Microsoft Teams, Google Meet) was used in nearly every case, apart from two instances where it was necessary to hold the interview over the phone. The interviews were then transcribed with the auto-transcribe functions enabled by these platforms and then edited and corrected by hand or transcribed by hand in full where necessary.

⁴² Schanes, K. et al. (2018) Food waste matters - A systematic review of household food waste practices and their policy implications. *Journal of Cleaner Production* 182, pp. 978–991.

Weekly meetings between the researchers were held to ensure consistency between the interviews as far as possible, and to compare early impressions.

5.5 Analytical approach

A process for analysis combining both inductive (building propositions/hypotheses from data) and deductive elements (looking for evidence of propositions/hypothesis identified in advance) was set out and approved, consisting of four main elements. These are set out in separate sections below. All coding was completed in Nvivo 14.

5.5.1 Profiling participants and Inductive analysis to identify relevant events

Events is used here as an umbrella term to capture any process or discrete phenomenon which may have an impact on a participant's beliefs or values. In the papers collected from the REA, a wide range of possible events and identity processes were noted. Similarly, the initial interviews participants discussed a wide range of phenomena which affected their beliefs. These were grouped into contextually relevant codes. Short biographical profiles were written for each participant. These summarised the life course of each participant and served as a useful context for the later stages of analysis.

5.5.2 Matrix coding

The Matrix coding feature in Nvivo was used to compare overlapping coding references. In this case, the feature was used to identify overlapping references to value changes and events. Once this matrix coding was completed, further matrix coding was used to assess relationships between values and between single values and specific types of events. Once these steps were completed, relevant coding references were examined in light of relevant literature in an iterative process, and conceptual diagrams were created to summarise potential relationships, complementing further theoretical development. The following section details these findings and analysis.

6 Key findings

6.1 Research questions

To understand how values and beliefs change over time and their relationship to food waste more broadly, the following research questions were devised:

1. How do values and beliefs relate to relevant consumer behaviour?
2. How do values and beliefs related to food waste develop?
3. How do values and beliefs related to food waste change over time?
4. How do thrift and frugality relate to food waste beliefs?

Table 6.1 summarises the findings as they relate to the different research questions directly.

Table 6.1 Research questions and relevant findings

Research Question	Relevant findings
How do values and beliefs relate to relevant consumer behaviour?	Sustainability beliefs are affected by the changing environment – both climate change but also life circumstances. Participants notice and sometimes change their behaviour in response to environmental issues they observe.
How do values and beliefs related to food waste develop?	Childhood experiences have a significant role in forming the values that people relate to food waste in later life. Most participants did not make an unprompted connection between emissions and food waste due to overtly moral framings of food waste among participants e.g food waste was seen as an issue of inequity or the “hungry other”.
How do values and beliefs related to food waste change over time?	Food waste-associated values may change in response to particular transitions in the life course, e.g. when children leave home, and provisioning practices have to be re-evaluated. Some people may re-evaluate their food waste-related beliefs based on significant environmental or social events. There is a role for media to play in changing beliefs, but it is unclear how significant this role is, or if the role simply contributes to background beliefs.

How does thrift/frugality relate to food waste beliefs?	Participants often associate Thrift and Frugality with a pre-consumerist perspective on food and food waste e.g. post war rationing. These values embody an idealised perspective on food and food waste and are at odds with the current narratives of consumption – e.g. the notion that previous generation were more frugal and implicitly less wasteful.
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6.2 Values and beliefs at the intersection of food waste and environmental impacts

A significant number of participants discussed climate change as a major concern and stated that climate change concerns drove their behaviour change. Participants discussed climate change using their own experience, broadly in line with recent research on the effects of extreme weather events on climate change beliefs and environmental behaviours^{43,44}. However, this was not linked to food waste. Food waste was generally understood as related to environmental issues but as an environmental problem arising from waste disposal with implications for social inequality.

Participants also had a range of perspectives on what counts as ‘food waste’ and felt that food waste caddies, or disposal systems in general, were considered an adequate solution to the waste aspect of that problem. For example, food that was disposed of in designated food waste bins was not seen as waste anymore but as a recovered resource. The general problematisation of food waste was based on the ‘hungry other’- this suggests that food waste is connected to values derived out of concern for the wellbeing of others than a concern for nature. The following explores how participants framed these two aspects.

6.2.1 Framing beliefs about climate change in everyday life

As part of the interview process, participants were asked about environmental issues in very broad terms. The questions were broad so that participants could focus on whichever environmental issue they considered a priority and provide justifications for it. A number of the

⁴³ Osberghaus, D. and Fugger, C. (2022) Natural disasters and climate change beliefs: The role of distance and prior beliefs. *Global Environmental Change* 74(March), p. 102515. Available at: <https://doi.org/10.1016/j.gloenvcha.2022.102515>.

⁴⁴ Rüttenauer, T. (2023) More talk, no action? The link between exposure to extreme weather events, climate change belief and pro-environmental behaviour. *European Societies*, pp. 1–25. Available at: <https://doi.org/10.1080/14616696.2023.2277281>.

participants focussed on climate change and naturally introduced food waste, while others focussed on different issues.

Participants often framed sustainability and climate change discussions as processes and events which could impact their values and beliefs. The examples in this section, therefore, show participants relating their personal experience of climate change or other environmental changes and how it has impacted their beliefs about it. Some examples of this are provided below.

"More recently I've [... become] more interested in the environment because I think when I was, well when many of us were younger, climate change and global warming and things like that, I don't know. It seemed like a million miles away and it didn't really seem it was realistic 20 years ago like it was actually going to happen. [...] So you notice the changes in the weather and things. We're having more storms. We're having more erratic weather, things like that." [Catherine, Woman, 40-49]

"Climate change. What are they doing about it? Very little as far as I can see. And I was filling in a thing this morning that was asking about climate change [...] I mean, there's been hot summers in the past, 76. You wouldn't have been born then, but that was a hot summer. But not like we get now, not the rain and the wind". [Alison, Woman, 60-69]

These examples were selected as the instances in which participants most explicitly shared their experiences of climate change. Looking at participants talking about such events may hold insights into how beliefs about nature may be changing. It also provides context on the background beliefs of the participants on a key topic that is relevant to climate change. However, it is important to remember that only a small proportion of the participants discussed climate change in this way.

The majority of participants that mentioned climate change broadly accepted anthropogenic climate change and also accepted some degree of responsibility, stating small actions they took to reduce emissions. Participants seemed content to act on a minor level based on an awareness of a need, awareness of consequences, and ascription of responsibility, but the preconditions beyond that and the broad actions discussed appeared to be much more

contested and questioned. Outright denial among the participants was limited. Only two participants engaged in climate denial, with one denying any need to act on a religious basis and the other denying anthropogenic causation. Participants also noted other areas of environmental change in which they had personal experiences, such as the changing cultural position of meat (among family and friends) and the decline of biodiversity (personally witnessed in local areas).

6.2.2 Missing connections between the potential impact of food waste and Climate change

Food waste in households is responsible for a significant proportion of overall waste in the food system and is a problem because this waste essentially wastes the resources, energy and emissions involved in the production, processing, and transportation of food. It was not clear that participants in this study agreed with this framing, even if they identified food waste as a problem. The participants of this study generally identified food waste as a social, moral or economic problem instead. When participants did connect food waste to environmental issues, the treatment of the waste is often problematised, and if they can dispose of it properly (with a food waste caddy), then the problem is considered to be resolved, as in the following example from an interview with Patrick.

“We waste very, very little here [...] So we pay attention. I like the fact that they've taken sort of dates off things like milk. So people are more encouraged to sniff it rather than, you know, milk's a couple of days over... We'll still give it a [sniff]- you know, see if it's not good, you know [...] It's very, very infrequent if we chuck anything away and if we do, we've got a food caddy for it to go into” [Patrick, Man, 30-39]

In this case, the provision of an appropriate means of disposal for food waste means that food waste is not considered to be a problem. Patrick feels he has met his obligations (as currently arranged) to society, the environment and the food itself by disposing of it correctly, because there is a conduit devoted to it⁴⁵. A number of other participants also suggested that disposing of food waste appropriately removed it or mitigated it as a problem. Based on this and other comments about the negative impacts of landfill disposal, it seems that in these cases,

⁴⁵ Evans, D. (2012) Binning, gifting and recovery: The conduits of disposal in household food consumption. *Environment and Planning D: Society and Space* 30(6), pp. 1123–1137.

participants considered emissions from improperly rotting food to be the root of the environmental problem with food waste.

A small number of participants did connect the issue of food waste to the wasted emissions aspect of food waste. These participants were usually well educated in sustainability issues or some part of their professional role involved sustainability, as was the case for Anushka who worked in a sustainability role.

“I just think that people really need to be more mindful about this. [...] I think I was reading about stats one day and then don't remember like exactly what the stat[istic] was, but then it was. It was just like horrific. It was just like crazy. How much amount of food goes to waste? And it's like so much energy [is] put into processing that food which leads to climate, you know, change, the global warming and everything”.
[Anushka, Woman, 18-29]

Participants more often made vague statements that preventing waste was good for the planet, but they did not specify the nature of the problem clearly. There are only a few examples of participants making direct connections between environmental issues and food waste, and one is provided below.

“Well, I'm quite protective about not wasting food. So again, that's all about, you know, looking after the planet”. [Martha, Woman, 40-49]

Much more often, food waste was generally considered to be a problem of social inequality. The lack of a strong connection between food waste and emissions is, in fact, likely caused by a more fundamental ethical association between food waste and social inequality. In other words, food waste is more closely related to how humans treat each other for many participants than it is to how humans relate to nature. There is a strong contrast between efficiency-based systems thinking, which informs the policy approach to food waste, and the emotive spectacle of the suffering of others and inequality generally, which informs participant approaches to food waste. However, there is clearly potential for participants to engage in more abstract thinking about environmental issues, as a number of them independently raised food miles as an environmental issue they understood and took account of in other ways as part of their food provisioning.

Participants' accounts indicated that there are key values which appear to be essential for understanding food waste, such as thrift and frugality. However, it has been established elsewhere that there is no guaranteed association between thrift and frugality and green/environmental practices and concerns⁴⁶. At least one participant stated this explicitly as seen below and many others did so implicitly:

"But I do, I feel guilty about food waste, not from a climate change point of view, but other people point of view that I'm you know, I've bought food and I'm throwing it away and there's people that can't afford food. So I, you know, it's a conscience thing rather than a specific. I'm [...] helping the planet type thing". [Michael, Man, 50-59]

The lack of strong links between food waste beliefs and sustainability issues strongly suggests that further attention is needed to the values which inform beliefs surrounding food waste. The following section will engage with these values and other aspects of belief which inform food waste beliefs.

6.3 Beliefs, values and transitions

According to the findings of this report, the most significant belief/changes that take place through the lives of participants are grouped around periods of transition between life course stages. The most significant transitions identified in this report are the transition to independent adulthood and the transition to retirement. These stages involve changes to living situations, working arrangements and social upheaval. The beliefs that change differ depending on the individual personal journeys of the people involved, as well as their characteristics.

There are some patterns in these changes, linked to the similar nature of the challenges posed by each transition. For people close to retirement age, values adjust to the impending removal of work-related goals. Concerns for achievement based on social standards gives way to pursuits for gratification and novelty, or socially focused values like caring and dependability. Others found that changing caring responsibilities through parenthood meant finding or correcting values in opposition like the tensions between concerns for self-fulfilment and caring for their family. For younger people, faced with new social environments, processes of self-

⁴⁶ Evans, D. (2011) Thrifty, green or frugal: Reflections on sustainable consumption in a changing economic climate. *Geoforum* 42(5), pp. 550–557.

definition and adjustment were prominent. For many of them transitions are related to education and employment. Some participants discussed the need to find a social group that shared values based on a shared concern for achievement rather than indulging in gratification. Others found a need to balance these goals. It may not be immediately obvious how these life transitions and events and the values they affect relate to food waste. However, there is a range of values that interact with a desire to reduce waste in several ways. These values can be understood through their interactions with the values of thrift and frugality.

6.3.1 Retirement transitions

As people move towards retirement age, several events tend to occur in parallel and cause people to re-evaluate their values and beliefs. This happened to the participants in this study in several ways. Living parents often became ill around this time or required greater care, grandchildren were born, or participants' health began to deteriorate either gradually or suddenly. Participants also struggled to anticipate the details of life during retirement. In essence, participants recognised that the values they held during their working lives would no longer work for them in the future.

A common refrain from participants who had successful careers was that they wanted to prioritise their enjoyment of life in the future. This involves a straightforward transition from achievement as a core value towards pursuing gratification. The examples below give a sense of this.

"One month and half, two months or so, and my father passed away. I had to quickly get a flight back to the UK and of course he stays in a small island of Scotland [...].that brought home to me how important it was to kind of like make the most of everything and [...] I didn't realise it at the time, but it must have been in the back of my mind that when the [overseas] job finished, that was it, I was then going to sort of say look OK, that took me to 57. [...] you know in some of the longer trips I did, you would see people move in their 70s and 80s and they're going on and off and on aeroplanes with a wheelchair or what have you. No, I want to be doing these things where I can still walk." [Louis, Man, 60-69]

Some participants also reflected that they had 'mellowed' with age, with softening judgements of others and less concern for other people's opinions of them. There were also numerous

examples, which show how caring for family shapes the values of people at retirement age. A later section engages with this issue in more depth.

6.3.2 Early adulthood transitions

There is also a transitional stage in which young adults reconfigure their values and beliefs. This is most likely linked to the frustrations and challenges of life as a young adult and the perceived discipline and equanimity needed to succeed. Participants experiencing this change also saw this shift in reference to their immediate social milieu; they wanted to socialise and spend time with people who share this focus on discipline, likely for mutual support during this transition.

“Back then, everything that a teenager would do, partying or, we're talking about what we're gonna do next, what trip we're gonna take next, or maybe if it's a, you know, study group, if we'd like to study, you know, with if you want like to follow [the] same structure, to study at the same times, yeah, blah blah blah. But now [...] It has changed. I would like to be a part of a group where people have goals and ambitions, where people work towards, there was an ambition and where, there's no fakeness. Nobody's trying to fake it till they make it. They're just, they're very authentically, very originally just themselves”.
[Anushka, Woman, 18-29]

Another young adult participant is negotiating a balance between achievement and gratification values. She had been very focused and driven during her life so far but was experiencing doubt about the value of pushing herself continually. Her job search was having little success, and she was attempting to maintain her focus and drive by prioritising things she enjoyed and found stimulating. It is worth noting that several of the participants describing these issues particularly strongly were first-generation immigrants to the UK.

6.3.3 Changing caring responsibilities

Another set of life course transitions emerged around caring responsibilities which were directly relevant to food waste beliefs and practices. This included ongoing caring commitments and instances in which caring commitments had changed.

Two main areas of interest emerged. The first relates to the impact that active caring commitments have on food waste practices. Caring for an elderly person or child often means dealing with changeable appetites and unpredictable demands on your time. Some

participants noted that this significantly impacted their eating habits and food waste. Making decisions about someone else's eating habits is a central part of many caring responsibilities and relationships, and it can result in significant food waste despite the best efforts of carers⁴⁷. This does not strictly relate to beliefs, however, and is more concerned with the practicalities of managing a household.

Some participants also reflected on negotiating their changing caring responsibilities in relation to their own beliefs. For example, Victoria describes below how she had to change her behaviour once her children had moved further away and set up their own homes and families. This change involved tailoring the food in her fridge to her own needs, rather than the possible needs of her family.

"My fridges in my last house were always full and my door was always open and my children used to bring all of their friends to my house. When they were adults, they could always get a beer. They could always get something when they were [...] Well, it's very important that I keep my door open for everybody [...] But I had to, I had to change that because I wasted a lot of food once the circumstances had changed at home. [Victoria, Woman, 60-69]

As these changes occurred, her values shifted and food waste became a more prominent concern. Previously she was concerned with providing for the possible needs and desires of her adult children when they visited. This concern for hospitality and also relates to notions of hospitality linked to over-provision elsewhere⁴⁸. However, once they were not visiting so much and the participant herself was away more often (on walking trips), incidences of wasting and the negative feelings around these wasting events meant that she prioritised frugality in her decisions. Later in the interview, she also outlined how a house move had helped with this change in orientation, and that it was motivated by a reduced need and desire to be hospitable for her children. She was prioritising her walking interest and social life instead.

⁴⁷ Pickering, J. (2023) Household meal planning as anticipatory practice: The role of anticipation in managing domestic food consumption and waste. *Geoforum*; 144. <https://doi.org/10.1016/j.geoforum.2023.103791>

⁴⁸ Borg, K., Boulet, M., Karunasena, G. and Pearson, D. (2022). Segmenting households based on food waste behaviours and waste audit outcomes: Introducing Over Providers, Under Planners and Considerate Planners. *Journal of Cleaner Production*, 351, p.131589. doi:<https://doi.org/10.1016/j.jclepro.2022.131589>.

Another participant Bridget (Woman, 70-79) described a similar scenario. She had a large family and described cooking for them in bulk. She noted situations in which she had cooked large amounts of soup from habit even following her children moving away. She described seeing some TV reports on waste (without specifically mentioning how the report was framed), and her recognition and dislike of the waste she was producing led to a change in her behaviour. The deprioritisation of the need to be hospitable is clearly evident here as well.

Throughout the rest of the interviews, participants described making adjustments to a range of life events they were experiencing. When adult children move out, or become more independent of the parental home, which usually occurs around the same part of the life course, the values that parents hold often change in ways that have specific impacts on food waste. Food waste often also becomes more visible at this time, as patterns of provision relating to providing food for a larger household become inefficient and demonstrate larger amounts of wastage, at life course stages where people are likely to have more time to check such things. In this case it seems there are two possible motivations of value/belief change at play; the shifting priorities involved in adapting to a life without children present and the need to deal with additional food waste from maladapted household food provision.

6.4 Thrift and frugality - values and beliefs surrounding to food waste

Both thrift and frugality have a broad shared goal of limiting consumption.

6.4.1 Thrift, frugality and household dynamics

There are a number of events that occur in childhood that can affect values and beliefs associated with food waste, and these are key for understanding beliefs about food waste, but also about domestic power relations which may affect food waste behaviour indirectly. For example, participants explored how childhood experiences of post-war rationing – an enforced frugality and parental coping strategies from this period influenced their current values surrounding food and food waste.

“Looking back to my childhood, yeah, I think it was very much. It seemed a much simpler life. [...] It was always food on the table, but it was a fairly limited menu. And you know, and I suppose rationing was

still [...] on the go when I was very young. And my parents had come through the war. So, you know, as always, [there was] food, but you had to eat it and it was very much frowned upon if you didn't eat [...] Whereas now when I see my granddaughter at 5 and the multitude of things she has at her fingertips, I think my goodness it's very much a changeable order in those sort of terms". [Ben, Man, 70-79]

In cases like the example given above, frugality emerges as an important value. It is discussed as part of a simpler and more straightforward imagined past with less choice and distraction available in everyday life. In some cases this frugality is associated with immediate family, but it is also related to other people's homes, other people's children and grandchildren, and the broader consumption environment. It also invokes the idea of sufficiency, a standard level of consumption which is being widely exceeded by a wasteful society. By complaining of unrestrained consumption as a form of waste, this critique makes a virtue of restraint.

Memories of deprivation in childhood eating and family life shape the critiques that participants make of current practices, and demonstrate that tradition has a close relationship with thrift and frugality. Within these traditionalist critiques of consumerism and consumer culture the role of traditional family structures and relations of power between children and adults seem to be important. For many people, traditional practices regarding food and avoiding food wastage should be preserved as part of 'proper' behaviour regarding food.

It is interesting to examine how tradition forms part of wider beliefs, and as such how it relates to thrift and frugality. Traditions seemed to strongly affect how certain participants understood the food system generally, and tradition also seemed to affect how others evaluated the allocation of resources in society. In both cases, traditional systems of provision (whether real or imagined) were understood to be less wasteful, less competitive, and more frugal – and idealised. There is also a sense that these traditional systems were commensurate with an underlying moral order for the household.

6.4.2 Food waste - resourcefulness and responsibility

Most participants over 30 considered that their parents were less wasteful than current generations. This waste is not always conceived of in terms of food directly. Instead, participants tried to represent their relationship to environmental issues in terms of current food system approaches to preserving food, set against the way that older generations dealt with the same issue.

"Our grandmothers didn't put things in plastic as much, but they put things in pots and on cold shelves and all sorts and all sorts of things without fridges and freezers and they seemed to do fairly well. Most of the time." [Audrey, Woman, 60-69]

Audrey is equivocal about the issue of plastic packaging and the role it plays in preventing food waste. Elsewhere in the interview she justifies the presence of plastic packaging in the belief that it adequately preserves food and prevents food waste but acknowledges that it was done differently in the past. Other participants also referenced such techniques. Siobhan [Woman, 40-49] for instance discussed broader techniques that her parents used when she was a child, which she understands as thrifty and resourceful (saving carrier bags, composting scraps for a vegetable garden) as part of a wider approach to life which informed her approach to life more generally. Taken together, these connect strongly to a frugal ethos (understood here as a set of values) with a strong emphasis on responsibility, self-reliance and resourcefulness. Siobhan associates this ethos with past generations positively. It also forms part of a larger critique of modern society. It also shows that a number of participants consider there to be traditions of thrift and frugality involved in avoiding food waste which they have inherited from their direct relatives. It is significant to consider that during the interview, Siobhan also noted that she was attempting to implement some of these practices alongside more intentional practices of self-care and organisation in her life. This was to gain more control over her life.

The findings of this report on thrift and frugality offer insight into why food waste is considered a moral issue and individual or household failure rather than a systemic sustainability issue. Various practices involved with preventing food waste and limiting consumption play a role in performing or reiterating ideal domestic moral orders. Similar phenomena have also been noted by ⁴⁹, and other authors have also discussed how household interactions and relationships affect food waste production or avoidance^{50, 51}. When a participant discusses past practices and compares them to current practices favourably, for example, or state how their current practices differ favourably in comparison with past practices, they are often also

⁴⁹ Keegan, E. and Breadsell, J.K. (2021) Food waste and social practices in australian households. Sustainability (Switzerland) 13(6).

⁵⁰ Evans, D. (2011) Blaming the consumer - once again: The social and material contexts of everyday food waste practices in some English households. Critical Public Health 21(4), pp. 429-440.

⁵¹ Evans, D. (2012) Binning, gifting and recovery: The conduits of disposal in household food consumption. Environment and Planning D: Society and Space 30(6), pp. 1123-1137.

making value judgments on the social relationships in their household, and there are a number of examples of this given in the results section. These judgements draw on subjectively fixed social and moral orders specific to each individual. Each has a conception or set of beliefs about how the social relationships determine how food waste and eating should be in a household (i.e. that a child should eat what their parents decide to serve them). In these situations, the subject of critique is not food waste per se but the problematic arrangements in the household that lead to waste. Thrift and frugality are key values which are involved in limiting and modulating waste, but like consumption, these values are often understood by participants in terms of what they say about household relationships⁵². System-level beliefs about the environment, by comparison, have no clear relation or relevance to the more immediate frame of reference of the household and the decisions that lead to waste. This represents a possible explanation for why discussions of consumer food waste often do not concern the efficient use of resources at the system level and instead take a moral tone.

⁵² Miller, D. (1998) A theory of shopping [electronic resource]. Cambridge, United Kingdom: Polity Press.

7 Food waste specific beliefs

7.1 'Wasted potential' framings of food waste

Foundational aspects of morality appear to shape how participants frame food waste and respond to it in their own lives. This is not unconnected to the motivational goals of the Schwartz values but the reasoning is more abstract and relates to wider belief systems. There also appear to be recurring events in people's personal childhood experiences that strongly shape their beliefs around food waste.

Throughout the interviews, many participants framed food waste as a moral problem using the figure of a 'hungry other', that could have had access to uneaten food. Food waste is constructed as an injustice through this figure. This figure is sometimes loosely constructed around tropes of famine victims and charitable appeals for famine relief. The references to this figure other range from specific to very general, as can be seen from the following examples.

General Example:

"It's a shame that [so] much [is] wasted. The food banks are all there for a reason, but a lot of those can't take fresh foods because they they're only open on certain days and so they can't. They can't keep fresh foods and until the people that go there don't, can't always get the fresh foods. [...] Because that's somebody's going hungry today. Who could eat that food or make use of that food, or somebody could help them cook it into something that they could eat to put food on that table. And the ideas of them being hungry tonight because they can't make up a super stew out of some old vegetables or something like that. It's a shame. That's the shame of it. And if it finishes up in landfill or something that never, never does any good anyway, does it?"
[Audrey, Woman, 60-69]

Specific Example:

"I don't like throwing away food. I think it's a waste from a money point of view [...] you know I've lost count the number of times we said

to the kids. You know, I think of the people in Africa. You know, I remember and it still upsets me to this day watching the Live Aid video, the original reason for the Live Aid concerts and the whole movement, live aid and having lived in West Africa as well and seen it" [Michael, Man, 50-59].

Participants were aware that it is unlikely that immediate food redistribution would be able to solve the problems noted but they still find the presence of the 'hungry other' disquieting. The fact that they recognise this does not remove the moral imperative to act to prevent waste in their own lives. Evans⁵³ has argued based on material culture research focussed on waste in the home that much of the moral problem with the act of wasting food is centred on dealing with the declining use-value of food. Material culture research is concerned with aspects of culture rooted in objects and architecture. Within this approach, the wasted potential of food to feed people is a cultural problem, rather than the wasted resources used in food production. This offers a potential explanation for why participant framings of waste as a problem are often based on concerns for other people.

7.2 Frugality and sufficiency-based understandings of waste

A smaller number of participants framed waste in a different way, as a problem of lifestyle, relatively unconnected to a hungry other. Waste is recognised as an environmental problem, but this is secondary to the problem of exceeding sufficiency in consumption. The framing involves within the idea that consumption beyond sufficiency is inherently wasteful. This seemed to be closely related to asceticism and frugality, as the limitation on consumption is desirable in intrinsic terms. This link was discussed explicitly in one case with a participant considering the role of religious asceticism in his own life. The idea of sufficiency will also be explored later in the results section.

The discussions of waste that led in this direction emerged directly from parts of the discussions in the interviews which focussed on climate change. Two participants are relevant here explicitly stated that their understanding of climate change and related issues were shaped by

⁵³ Evans, D. (2012) Binning, gifting and recovery: The conduits of disposal in household food consumption. *Environment and Planning D: Society and Space* 30(6), pp. 1123–1137.

their Christian religion. These participants both denied that climate change was something that people should try to do anything about. For them climate change was either part of the plan that God has for humanity or should be considered beyond the control of humanity as a complex natural process governed by God. These aspects of marginal worldviews are based in religious doctrine, and as such may be difficult to engage with. The ideas of sufficiency and appropriate lifestyles that they also use may be much more amenable to change and recur in other contexts through the dataset. There are counterexamples in the dataset, of religious participants that accept anthropogenic climate change, but experiences of climate change and environmental degradation also informed their beliefs in these cases.

7.3 How childhood experiences influence food waste beliefs

In cases where participants discussed childhood experiences relevant to food waste, it was often discussed in relation to parents mentioning the hungry other to get them to eat, or in some cases simply refusing to offer alternative food or eating times to children. This was mentioned often, and numerous participants brought up a less wasteful past. It is very common to see people appealing to a better past when reasoning around environmental issues and it is not remarkable. Despite this, a handful of participants rejected past practices in adulthood due to shifts in beliefs about food and intergenerational relationships in the household.

“My grandson, you put a plate of food in front of him, and if he eats it, he eats it. [...]. Now I don't mind if you don't like it, don't eat it. If you're full, don't eat it. [...] I think it probably goes back to I used to go to my granny's in Edinburgh and we would have dinner and we would have to eat it and then I got this rice dish put in front of me one day out of a tin and I hated it and I was told that if I didn't eat it, I wasn't getting anything else to eat. So it was put down to me for the next [day][...] I've never forgotten that, being forced to eat something that I can't stand and to this day, I still can't stand the smell of it and even the mere thought of it, yuck. So yeah, I think it goes back to that”.
[Jessica, Woman, 60-69]

"No, that was all to do with the counselling that I had and the counselling training that's changed my feelings about food. Because I think again, I was very much a product of my, I mean I was brought up with you know, you have to finish that because of the starving children in Africa. When I did the counselling, I realised that I wasn't actually helping the starving children of Africa. By eating everything on my plate and putting weight on. [...] And you know, I am not. I am not a dustbin. You know, you don't have to finish what's on the children's plates". [Nicole, Woman, 60-69]

These examples show what is implicit in the many other examples of participants discussing past practices approvingly. The power relationships which go along with traditional family structures and parenting styles are rejected, as independence has become more highly valued. An example of an approving discussion of such follows.

"I was born just after, well 1950. So, [there] were still elements of rationing, although I was too young to know about it. But there was no choice. You got what you got, what was put down to you by your parents. And as I say, if you didn't eat it that was it and it wasn't a choice. And I think sometimes there is too much choice. There's too much choice for individuals, for particularly the children. And I know that my daughter can have three different meals for the family". [Richard, Man, 60-69]

Food waste beliefs are connected to the interpersonal relations in the household. Richard is concerned about his daughter spending too much time and effort cooking different meals, drawing on a vision of a more straightforward past with clear domestic power relationships as a balancing ideal to time-consuming choice. The adult is in firm control of household provisioning and the eating habits of the child. What differentiates participants that rejected past practices from participants that still promote past practices appears to be the level of investment in traditional domestic power relations between children and adults.

7.4 Nature and sustainability in moral framings of food waste

While it was rare for participants to make direct connections between climate change and food waste, nature and sustainability are still discussed in relation to waste. Broader connections to environmental issues are made, and people often considered the problem with waste to be the end-of-life disposal of items in landfill. In the example from Richard below, it is possible to see how participants tended to refer to a broad environmental crisis rather than a specific climate crisis linked to emissions.

"I think now people are realising it and it's coming up through people in my age group. I mean I'm doing my wee bit. I can't go and protest but I can contribute in other ways and you know, doing my share and making sure that everything, you know, doesn't go into landfill or goes into whatever, try and try and maintain that. And just encourage my grandchildren to, you know, not to accept things and not to waste things, because when we have the grandchildren for tea here, there's usually more food waste than I like, because I keep telling them when I was your age, if I didn't eat it, I would go hungry, whereas they have so much. You know and that's something I think they have still to latch on to. The grandchildren have been very fortunate. [...] Their parents have both got you know, well paid jobs and they don't really want for anything which in some respects is a challenge in itself to try and get them to realise that. You know there are things out there that are a lot worse". [Richard, Man, 60-69]

In this case Richard uses language and ideas suggesting that he believes there are distributed social responsibilities for dealing with environmental issues, twice referring to how he performs his responsibilities correctly. He describes his own generation as undergoing a significant shift in opinion about environmental issues and elsewhere states that these obligations were not met in the past by his generation. This framing raises the environment as something towards which people have a set of moral obligations. He later discusses the obligations of his children to recognise and act on the responsibilities that come with their position in society. The problematisation of waste in this case quickly progresses from obligations to the environment, to concerns for maintaining the appropriate distribution of responsibility across generations and social positions. Other participants discussed the obligations of their children in a similar manner when raising environmental issues. This is also often raised in relation to domestic practices and ongoing behaviour around food.

As in other places, discussions of environmental issues around waste very often become criticisms of society. In this case Danielle criticises the 'throwaway culture' associated with consumerism, with an ideal of frugal behaviour clearly in mind. This is all understood in terms of individual moral decisions, and as such, frames his own positive contribution in the same terms.

"Just the whole kind of disposable culture and the people feel it's OK to just use as many plastic bottles as they can and not think about recycling and what the effects of air pollution and just individual choices that people make around about consumerism again, that's really changed over the past 20-30 years and it's not for the good.[...] I try my best to keep up personal choices and values like around recycling and reusing things and you know, not endangering the planet any more than I have to. You know, I don't drive a car. I don't choose to go on excessive journeys abroad and make more personal choices round about using public transport and walking where possible I can" [Danielle, Woman, 50-59]

In this case the idea of sufficiency returns. Values focussed on protecting nature appear to require an idea of sufficient consumption as do thrift and frugality. Thrift and frugality permit consumption within restrictions but are not necessarily oriented towards nature. This section establishes the idea that people have to balance sufficient consumption levels against other, different values, while also managing their interpersonal relationships and expectations around the responsibilities of others for consumption and waste behaviour.

8 Implications for policy, research and interventions

The following section provides some valuable insights that can inform the development of effective policies, guide future research, and shape interventions aimed at reducing food waste.

8.1 Making the link between food waste and the climate crisis/emissions

Policy-informed conceptualisations of food waste are predicated on the idea that food waste results in wasted emissions, from the production, processing and distribution of ultimately uneaten food. However, while the participants of this research did not make this link between emissions and food waste naturally, there was a widespread understanding of food miles among consumers. An understanding of food miles means there is a familiarity with the emissions impacts of food that is unrelated to the emissions or other impacts from disposal. This understanding of non-waste emissions and energy-use is used to justify or establish the desirability of local food through the concept of food miles, but it is not deployed visibly in relation to food waste. A potential reason why participants did not make the connection to the standard policy discourses around food waste may be the treatment of food waste as a social or moral problem rather than as a systemic problem. It appears that slow changes in belief about climate change, the increasingly visible impacts of climate change, and other related food system concepts could all play a role in altering values and beliefs which might impact food waste behaviour.

While a small minority of participants acknowledge the link between food waste and the climate crisis due to wasted emissions, the majority of participants did not link the two issues directly. It may be possible to lead consumers to make stronger associations between these two issues with communications illustrating the systems-level nature of this connection however, because consumers also generally understand and respond to similar system level concepts such as food miles.

8.2 Opportunities for updating or contributing to consumer segmentation

While there has been plenty of research and communication around consumer segmentation with regard to food-wasting behaviour, life course transition points have not yet been a focus. This report shows that there may be some value in approaching segmentation with a view to taking into account periods in which values and beliefs relevant to food waste may change. This is similar to the segmentation system proposed by Borg et al⁵⁴. Further research would be needed to confirm specific groups and values, but some values which could influence key themes for communications strategies for specific groups include:

- a focus for communications aimed at age groups 45-70 years old could be on the transition from caring responsibilities to more self-focused activities.
- Thrift and achievement as a combined focus for communications aimed at young adult groups (18-30).

8.3 Targeting thrifty and frugally motivated consumers differently

This report is not able to provide insight into how behaviour may change with the changes of beliefs of consumers reflected on directly, but it does show that thrifty and frugal consumers have meaningfully different approaches to consumption, and that these slight differences can relate to different values and background assumptions about the world. For example, frugal consumers often have a broader critique of consumer society and may respond to efficiency-based messaging. Thrifty consumers, on the other hand, may respond better to messaging based on the other goals that reducing waste may help them achieve such as financial savings. Further quantitative research with a larger sample size, could establish criteria for segmentation research on this basis.

⁵⁴ Borg, K., Boulet, M., Karunasena, G. and Pearson, D. (2022). Segmenting households based on food waste behaviours and waste audit outcomes: Introducing Over Providers, Under Planners and Considerate Planners. *Journal of Cleaner Production*, 351, p.131589

8.4 Subjective life experiences may restrict engagement with food waste reduction practices

A number of beliefs noted in this report override concerns with waste. Negative relationships with food are common due to events in childhood or illness, meaning that food waste avoidance is deprioritised in favour of actions driven by other values. Similarly, there are values informed by life experience and situational priorities that mean that food waste avoidance may be deprioritised. Efforts to estimate the prevalence of such negative experiences and the effects of the resulting altered behaviour in the population may be important when considering future consumer segmentation.

Future research and policy could focus on transitions more productively as well. Such transition periods involve reconfigurations of values but they also involve changes to how food is provided in the home that are practically and ethically significant to everyday life. Further examination may reveal these transitions to be useful contextual levers for enabling further reductions in household food waste for specific groups of people (parents close to child-independence age, retirees and others responsible for home-making etc.).

8.5 Limitations of this research

8.5.1 Framing challenges related to Food Waste

During the development of the research design and the research instruments (interview guide, questionnaire, etc) it was felt that the section of the research related to food waste alone could negatively impact the section on beliefs, due to the specific desirability bias problem associated with food waste research. This part of the research was placed after the section on beliefs to prevent this issue and this was largely successful. This means that food waste was not discussed in enough depth in some cases, as this section was at the end of the interviews. Clearer connections to food waste specific behaviours could have emerged if this was done differently.

8.5.2 Sample Diversity

For a qualitative study, the sample size was more than adequate. Generalisability based on sample sizes is often not the goal of qualitative research (but through theoretical saturation) (Baker and Edwards, 2012). For qualitative studies, diversity in a sample may be more valuable because it may have a direct bearing on the rate at which theoretical saturation is reached. As demonstrated in the relevant table in the methodological section, the sample was not particularly diverse; the participants were mostly white, above 50 years of age, and were predominantly female. During the research, it was felt that saturation was only reached in the final 10 interviews, meaning that this issue did not impact the conduct of the research overmuch.

8.5.3 Interview length

The Interviews ranged in length between 1 hour 30 minutes and 40 minutes. Considering that some of the questions were quite involved and focussed on biographical details, the length of some interviews was inadequate. In these cases, participants did not answer questions in sufficient depth. It was difficult to correct and control this issue due to participants' unwillingness to answer questions in more detail. Increased efforts to follow-up on answers may have improved interview length and the quality of response.

8.6 Potential areas of research

8.6.1 Foundations of thrift and frugality

From a purely academic perspective, this research has raised a number of questions regarding the background of thrift and frugality. What these ideas originate from, their philosophical background, and how they are part of the lives of consumers are all potential questions that this research did not have time to investigate in more detail. How these ideas relate to current behaviour should be explored in more detail, and particularly how it could interact with campaigns and policy.

Some of the foundations of thrift and frugality in this country are potentially grounded in Christian religious traditions associated with prosperity (protestant work ethic etc) and asceticism (monastic orders etc). Much less is known about how other religious traditions interact with thrift and frugality, despite ascetic traditions occurring in numerous religions. Even less is known about how different cultures engage with food waste and traditions of thrift and frugality. This could be broadly socially useful research in a multicultural society. It may also

be useful in a period where food insecurity is rising in the UK and supply chain disruptions have become more frequent.

8.6.2 Historical thrift-frugality practices and beliefs

It is not clear to what extent the stories participants told in this research were accurate accounts of past practices and wasting behaviour. Oral history and archival methods may be able to provide some insight on this issue. Such research could shed light on changing tolerances of monotony and restriction in food choice and the effects of these things on current practices. There were several participants in this research that rejected their parents' frugal approach to food in later life, suggesting there may be nuanced variations in traditions of frugality and thrift that change over time.

8.6.3 Interrogating sustainability as part of everyday life

The limitations of this research mean that it is difficult to assess public acceptance of the climate/system efficiency-based messaging on food waste. If it has been accepted, it is not clear how far it shapes decisions. In the context of some of the practical moral details that thrift and frugality values are often concerned with, systems-thinking approaches to food waste seem abstract and too far removed from daily life to have a large impact on behaviour.

9 Conclusions

This research explored how individuals' values and beliefs change over time and the relationship between changes in values and beliefs and perspectives on food waste. The study also considered how individuals reflected on food waste in the context of wider environmental issues and the role of thrift and frugality in shaping people's values and beliefs about food waste. The study employed a qualitative approach to answer these questions. This involved 71 interviews conducted remotely with people across Scotland. The study used Schwartz theory of basic universal values to conceptualise values and beliefs. This provided a useful framing for categorising a wide range of perspectives emerging from the interviews.

Life course transitions emerged as the most significant influence and cause of change in values and beliefs in this report. This largely echoes psychological research on belief change. Life course transitions are periods of change from one period to another. In this case, the transition to retirement and the transition from teenage/student years to independent adulthood appeared to be the most significant in terms of belief change. The transition to retirement/children moving out may be more impactful in terms of avoiding food waste because of the significance of the change in provisioning involved. There is also the potential for crisis events to take place during this period with greater frequency, particularly the illness and death of parents. These transitions can often trigger a reflection on previous values among individuals. There is a significant opportunity here for policy, campaigns, and further research to take advantage of these transitional periods to capitalise on belief changes that are already in progress.

Another contribution that this report offers is an insight into the role of thrift and frugality as a separate set of related values specifically oriented towards limiting consumption in everyday life. Thrift and frugality may be key values which drive food waste avoidance, but they are also deeply involved in regulating other values which have relationships between them, such as achievement and hedonism. Thrift and frugality also operate as key parts of broader belief systems, especially with respect to the role of humans in the environment, making it additionally meaningful for food waste reduction.

New insight is also offered into values and beliefs relating to the environment, and specifically how food waste beliefs relate to these. Most participants appeared to accept anthropogenic global warming and accepted the need to do something about it, even if the question of

exactly what was contested. Participants also expressed beliefs about other environmental issues, such as declining biodiversity. Apart from one case, no direct explicit association was made between household food waste and emissions, and the role of food waste in global emissions. Food waste was generally considered a waste problem, to be solved by disposing of it correctly through a dedicated waste stream (e.g. a food waste caddy collected by local authorities). Participants in this research display some understanding of systems-level thinking in other areas as food miles were raised as an issue regularly without prompting. This suggests that the public may respond positively to campaigns that make the connection between food waste and emissions more explicit.

Throughout this conclusion, several points related to thrift and frugality and the environmental concerns of participant fed into a theme running through this report: the moral ordering of the household. The beliefs of individual participants are vitally important, but this report has also begun to indicate that the moral context or environment in which food waste beliefs inform behaviour are also important. This finding emerged from evaluating how childhood experiences inform beliefs around food, how sustainability issues are managed in the home amid other concerns, and how the moral weight of food waste as a moral issue between household members is dealt with in the home. The resulting picture involves a domestic space in which there are pre-existing moral priorities and hierarchies (relating to patriarchal structures, divisions of labour, and provisioning effort) into which beliefs relating to food waste (and hungry others) fit. This offers an alternative explanation for the moralisation of food waste by households that does not rely on the individual. In terms of research aiming to help reduce food waste, conceptualising food waste values and beliefs as acting in relation to the household may be an important development.

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11 Appendices

11.1 Appendix 1: Summary of Rapid Evidence Assessment.

Search strings:

Value terms (VT): Valu* OR goal* OR belief OR moral* OR identit*

Population terms (PT): house* OR citizen* OR consum* OR parent* OR famil* OR individual* OR child* OR personal

Change terms (CT): change* OR shift* OR interv* OR consisten* OR manipul* OR enhancement OR important* OR compar*

VT (title) AND CT (title) AND PT (topic) restricted to 2010 onwards.

Searched on Web of Science and on Scopus.

Excluded engineering, medical/dentistry/nursing, computer science and natural science related topics.

Total number of results after de-duplications = 3326

Then abstract sift based on the following inclusion criteria:

- There must be a change in one of the value terms (value/goal/belief/moral).
- The change in behaviour must be experienced by one of the populations in the population terms.
- Must be in English.
- Must be since 2010.

Total after abstract sift: 310 that matched the inclusion criteria.

Total full texts that were available online/appropriate for inclusion: 280.

Several texts were not available in English, just the abstract was. Others could not be located.

Full text sift: 104 included.

11.2 Appendix 2: Relevant papers from Rapid Evidence Assessment

Papers selected and read on the basis of topical relevance. Presented in the form of reference list:

Ahn, J.S. et al. 2022. Value change across adolescent years: How do adolescents' intrinsic and extrinsic values develop? *Journal of Research in Personality* 99(February).

Akaliyski, P. et al. 2023. Values in Crisis: Societal Value Change under Existential Insecurity. *Social Indicators Research* (0123456789). Available at: <https://doi.org/10.1007/s11205-023-03226-2>

Ali, D.S. et al. 2013. 'I Became a Mom': Identity Changes in Mothers Receiving Public Assistance. *Journal of Social Service Research* 39(5), pp. 587–605.

Alonso, Y. et al. 2013. Value change and post-modernism: A preliminary study of a german sample. *International Journal of Psychology and Psychological Therapy* 13(3), pp. 277–287.

Alteneiji, E. 2023. Value changes in gender roles: Perspectives from three generations of Emirati women. *Cogent Social Sciences* 9(1). Available at: <https://doi.org/10.1080/23311886.2023.2184899>

Bajracharya, S.M. and Maskey, V. 2016. Students' awareness, values, perceptions, and behaviors toward environmental sustainability (ES): A comparative study. *International Journal of Sustainability Education* 12(3), pp. 1–14.

Barbarossa, C. et al. 2015. This item is the archived peer-reviewed author-version of: A self-identity based model of electric car adoption intention : A cross-cultural comparative study. *Journal of Environmental Psychology* 42, pp. 149–160.

Barnett, G. et al. 2021. What works to change identity? A rapid evidence assessment of interventions. *Journal of Applied Social Psychology* 51(7), pp. 698–719

Bilbao, M.Á. et al. 2013. Changes in Basic Beliefs and Post-Stress Growth: A cross-sectional study on the strong impact of positive events on well-being. *Terapia Psicológica* 31(1), pp. 127–139.

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- Hudson, N.W. et al. 2021. Your Personality does not Care Whether you Believe it Can Change: Beliefs about Whether Personality can Change do not Predict Trait Change among Emerging Adults. *European Journal of Personality* 35(3), pp. 340–357. Available at: <https://doi.org/10.1002/per.2289>
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