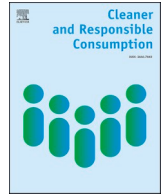


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Consuming responsibly: Prioritising responsible consumption behaviours in Australia

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ABSTRACT

Human behaviour is at the centre of unsustainable consumption and production. Responsible consumption behaviours must therefore be at the centre of the solution. However, because it is inefficient for policymakers and practitioners, and ineffective for users, to attempt to target all responsible consumption behaviours simultaneously in a given initiative, some form of prioritisation is necessary. Through a combination of collaborative workshops and surveys with key stakeholders, this study applied established methods of prioritisation to identify a 'long list' of 84 responsible consumption behaviours across three material streams – fashion, electronics and furniture. The 'long list' was then taken to a prioritisation summit with government, academic, business, and community stakeholders. The behaviours were rated against explicit prioritisation criteria related to likelihood of adoption, timing, impact and potential system reach. This yielded a final 'short list' of seven prioritised behaviours, including a mixture of achievable consumer behaviours that can be realised in the short-term, as well as larger-scale and longer-term manufacturer- and government-related behaviours supporting fundamental design and policy shifts. By drawing on the collective knowledge and expertise of academic and non-academic experts, the study identified and prioritised behaviours to reduce material resource consumption in Australia that are impactful and transformative, while also being practical and realistic to implement.

1. Introduction

Complex environmental problems such as climate change, biodiversity loss, and material resource consumption require collaborative approaches to identify and prioritise appropriate solutions. As stated by Schultz (2011), environmental problems are human behaviour problems, which means human behaviour is a key part of the solution. However, complex environmental problems have a multitude of behavioural barriers and solutions. This presents a challenge for environmental researchers, policymakers and practitioners with limited resources and a desire to change human behaviour (Kneebone et al., 2017). Even with a detailed understanding of the different behaviours that contribute to an environmental problem, it would be unfeasible, and ill advised, to attempt to target all possible behaviours simultaneously. Behaviour prioritisation can reduce this burden by exploring which behaviours are likely to make a difference to the problem, and identify where resources and effort can be efficiently deployed, to design targeted behaviour change interventions (Clavisi et al., 2013; Gardner and Stern, 1996).

Prioritisation becomes progressively important when the number of target audiences and target actions increases (illustrated in Fig. 1) – ranging from simple problems with few target audiences and few actions to 'wicked' problems with many audiences and many actions (Kneebone et al., 2021). By breaking complex problems down into priority behaviours and audiences, the issue of choice overload can be overcome – i.e. where people are unable to make a decision when presented with too many options (Iyengar and Lepper, 2000). While behaviour change approaches typically applied in sustainability policy tend to focus on the most marginally impactful value for effort behaviours, it can also highlight 'difficult but rewarding' behaviours (i.e. those with more systemically embedded barriers), that may be important to consider for broader transformational change (Baum and Gross, 2017). In this sense, how behaviour changes are prioritised can play a role on the extent to which a given initiative uses behavioural insights to optimise and reinforce the existing system, versus realising the potential of 'behavioural public policy' to tackle more transformational change (Kaufman et al., 2021a).

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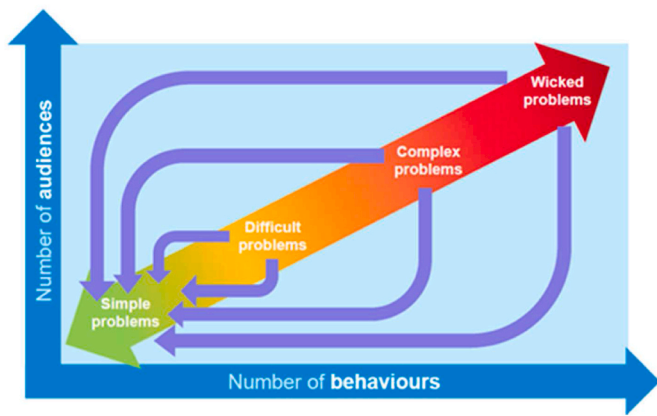


Fig. 1. Breaking complex problems down by identifying specific behaviours and audiences (Source: Macklin and Kaufman, 2023).

1.1. Prioritisation

There are many identification and prioritisation methods, including qualitative approaches that involve eliciting ideas from individuals or existing literature (e.g. literature reviews, interviews, workshops) and quantitative approaches that involve ranking or rating the identified suggestions (e.g. surveys, group discussions, voting) (Levelink et al., 2020). In behavioural science, a combination of approaches is common, such as using a literature review for behaviour identification and then using survey methods among experts and/or end users for behaviour prioritisation (Boulet et al., 2023; Kneebone et al., 2017; Selinske et al., 2020). While the best approach depends on the context, purpose, and other relevant factors (e.g. time, resources), consultative approaches are believed to be superior in terms of outcomes and acceptance (Clavisi et al., 2013). This involves participation from a variety of stakeholders, including researchers and end-users, such as policymakers and practitioners – who are often missing from existing prioritisation approaches (Fadlallah et al., 2022).

In the social and behavioural sciences, it is recognised that research contributions to policy and practice rely on effective partnerships between researchers, policymakers, businesses, and not-for-profits, which focus on solving practical problems (Western, 2019). In healthcare research, consultative partnerships between researchers and stakeholders to inform priority-setting are becoming increasingly popular (Synnot et al., 2019). Collaborative approaches to environmental behaviour prioritisation are also gaining traction – e.g. water conservation (Kneebone et al., 2017), biodiversity protection (Selinske et al., 2020), sustainable transport (Pamucar et al., 2021), dietary preferences (Allenden et al., 2022), food waste reduction (Boulet et al., 2023), and climate change mitigation (Ratwate et al., 2023). However, to the best of our knowledge, such approaches have yet to be undertaken in relation to one of the most prolific environmental problems in the developed world – responsible consumption.

1.2. Responsible consumption

The United Nations Sustainable Development Goals (SDGs) are a global call to action “to promote prosperity while protecting the planet” (United Nations, 2023a). The goals emphasise taking a holistic and systematic approach to sustainable development in which strategies to protect the natural environment are developed alongside those that stimulate economic growth and a healthy and inclusive community. This represents a particular challenge in addressing SDG 12 – Sustainable consumption and production. SDG 12 requires solutions to reduce a country’s material footprint (i.e. material resource input at all stages from raw extraction through to processing and consumption) without negatively impacting communities or the economy (United Nations,

2023b). This complex challenge requires addressing a range of factors that can each contribute to the wider goal (Mazzucato, 2018).

Human behaviour is a key part (although not the entirety) of both the problem and the solution to sustainable consumption and production. Lifestyles of affluent populations in particular are driving unsustainable consumption, which is impacting economic development, global inequality, wellbeing, and planetary health (e.g. climate, pollution, and material intensity) (Raworth, 2017; Steffen et al., 2015; Wiedmann et al., 2020). In shifting to more sustainable lifestyles, affluent populations need to adopt behaviours that sustain environmental, economic and social wellbeing which change the nature and quality of consumption, while maintaining and/or improving quality of life (Akenji and Chen, 2016; Giannetti et al., 2022; Gossen et al., 2019). This represents a significant challenge because, historically, economic growth has been closely entwined with material intensity (Aslam and Ghouse, 2023; Wiedmann et al., 2020), and even the ‘shape’ of that growth can also determine the extent to which it supports human flourishing, or inequality and disadvantage (Denniss, 2017).

Additionally, the need for responsible consumption behaviour change extends beyond consumers. While changing the impact of consumer behaviour is arguably the ultimate target of responsible consumption, behaviours could be changed at various stages along the supply chain (e.g. manufacturers or retailers) or by other powerful actors (e.g. local or State governments) which enable more responsible consumption by end-users (Macklin and Kaufman, 2023; Roberts et al., 2023). Responsible consumption also extends to behaviours beyond purchasing and use, including upstream behaviours (such as design and manufacturing) (e.g. Marchand and Walker, 2008) and down-stream behaviours (such as maintenance, repair, and disposal). For example, participating in the sharing economy requires changing multiple behaviours of multiple audiences, including suppliers/retailers (e.g. in the design and delivery of services) as well as consumers (e.g. to increase adoption and reduce misconduct) (Huang et al., 2023). In other words, responsible consumption is a textbook example of a complex problem with many audiences and actions, which requires a collaborative approach to identify potential target audiences and behaviours and prioritise them in order to allocate limited resources and develop effective behaviour change interventions.

Given the lack of existing behaviour identification and prioritisation activities in this space, the aim of this study was to address this research gap by applying established prioritisation methods, which have been frequently utilised in the healthcare space (Bragge et al., 2011, 2021; Synnot et al., 2018, 2019), to the environmental issue of material resource consumption. Specifically, we sought to address two primary research questions.

1. What behaviours could be adopted to promote responsible consumption in Australia (behaviour identification)? And
2. What are the highest-priority behaviours for which interventions could be developed to reduce Australia’s material footprint (behaviour prioritisation)?

The next section provides an overview of the study Materials and methods – including the study context, procedure, and participants – as well as data collection and analysis methods of the two key research activities, 1. Behaviour identification (i.e. the long-listing process), and 2. Behaviour prioritisation (i.e. the short-listing process). This is followed by a summary of the Results from each activity – including participant composition and key findings. Finally the Discussion explores the significance of the results, provides implications for practitioners, and acknowledges the study’s limitations and future research opportunities.

2. Materials & methods

2.1. The current study

In 2020, a collaboration of partners – including a university research institute, Federal and State government agencies, and a private communications organisation – agreed to take a missions-based collaborative approach to addressing responsible consumption in Australia. Missions-oriented policy involves using evidence to address problems by having a clear and ambitious direction while also enabling bottom-up solutions (Mazzucato, 2018). The collaboration partners agreed to combine their reach, resources, and expertise to explore how systemic behavioural interventions could support their shared mission goal – *to reduce per capita material resource consumption in Australia by 15% by 2030, while maintaining community wellbeing and economic resilience*. The mission goal was guided by SDG 12 as well as national and State-level targets (Commonwealth of Australia, 2018; Victorian Government, 2020). The purpose of the goal was to ensure that mission activities were guided by an ambitious and specific objective, recognising that the program of work itself would only be a starting point. The first step of the mission was to identify and prioritise behaviours which could contribute to the mission goal through the development and implementation of behaviour change interventions.

2.2. Procedure

After an initial review of relevant literature (Kaufman et al., 2021b) and consultation with the collaboration partners, three priority materials were agreed: fashion and textiles, electronics and electrical devices, and furniture and large household items. These materials represent waste streams of interest to the collaboration which also have notable gaps in behaviour change research, policy, and practice compared to other material types – such as food waste and single-use plastic/packaging.

In order to identify and prioritise responsible consumption behaviours, the project was guided by the key principles of a collaborative prioritisation approach (Bragge et al., 2021).

1. Determine the scope and unit of prioritisation and the target number of priorities that are realistic to address;
2. Identify relevant stakeholder groups in the area and engage with representatives to generate a 'long list' of potential priorities;
3. Use explicit prioritisation criteria and make the rationale for this clear to participants;
4. Prioritise a 'short list' from the long list through additional engagement with the same stakeholder groups; and
5. Communicate findings widely to all groups and individuals that have participated in the process.

Guided by these principles, the project involved two key activities – 1) a 'long listing' process to identify responsible consumption behaviours and 2) a 'short listing' process to prioritise the behaviours. The long-listing process involved a series of workshops and a national survey of experts to capture a comprehensive list of potential target behaviours. After analysing the qualitative data from the long-listing process, the same participants were invited to attend an online prioritisation summit to rate the long list against explicit prioritisation criteria in order to quantitatively identify a short-list of high-priority behaviours. This research was approved by Monash University's Human Research Ethics Committee (project: 30172).

2.3. Participants

Participants for the study (for both the long-listing and short-listing processes) were stakeholders with experience or expertise related to material consumption and waste prevention – including representatives

from local, State and Federal governments, regional waste groups, individual businesses, peak business and industry groups, community and not for profit organisations, and research institutes. Purposive and snowball sampling methods were utilised to identify and contact stakeholders. Relevant stakeholders known to one or more of the research team or collaboration partners were invited to participate via email. They were also requested to forward the email invitation to other relevant individuals in their networks, to capture relevant unknown stakeholders.

All participants who contributed to the long-listing process and agreed to recontact were then sent an invitation to participate in the short-listing process. For details about the sample composition for each activity see Section 3. Results.

2.4. Long-listing methods

As outlined above, the first two steps in prioritisation involve clearly defining the unit of prioritisation – i.e. a *behaviour* – and engaging with a diverse array of relevant stakeholders in order to generate a 'long list' of potential options. These steps help ensure that the list only includes relevant content (i.e. behaviours rather than attitudes) and covers a wide breadth of potential options.

The unit of prioritisation, behaviour, was defined as: an *action* performed by a particular *audience* towards an *item or type of material* that could help achieve the collaboration's mission goal. This approach was adapted from Fishbein and Ajzen's (2011) definition of behaviours which includes audience, action, target (e.g. material type), context, and time. For the purpose of this prioritisation exercise, context and time were seen as unnecessarily detailed and were excluded. Where possible, participants were also encouraged to focus on desirable behaviours rather than problematic ones (Kneebone et al., 2021) – e.g. instead of "consumers buy fast fashion items" (undesirable behaviour), "consumers buy good-quality fashion items" (desirable alternative).

2.4.1. Data collection

Data for the long list was collected via a combination of online workshops and an online survey. All prospective participants were invited to attend one of four online workshops or, if they were unable to attend the workshops, they were encouraged to complete an online survey at a time convenient to them. The first workshop was open to internal stakeholders only (i.e. those within the collaboration partner organisations), this included representatives from Federal and State government agencies, a private communications organisation, and a university research institute. The remaining three workshops were open to internal as well as external stakeholders (i.e. those outside the collaboration partner organisations), including representatives from local governments, State government agencies, regional waste groups, individual businesses, peak business and industry groups, community and not for profit organisations, and research institutes.

Multiple methods to generate the long list were chosen in order to provide participants with context and opportunities for clarification where possible, while also allowing responses to be collected from a relatively large sample of experts. The workshops were between 60 and 90 min in length, hosted on Zoom. Each session opened with a presentation to establish a shared understanding of the program, mission goal, and definition of a behaviour – with opportunities for clarifying questions. Participants were then invited to work in small groups to brainstorm ideas for the long list, captured directly in the online survey platform. Participants could identify up to eleven behaviours by specifying the audience, action, and item/material. Data was collected for the long list between August 25, 2021 and September 17, 2021.

Open-text fields were used to ensure participants provided suggestions that reflected specific behaviours but were also open and diverse, without being restricted to pre-conceived lists. For example, suggested behaviours could have included "retailers (audience) offer lease services (action) for clothing (item/material)" or "manufacturers (audience) design

for disassembly (action) ICT electronics (item/material)”).

2.4.2. Analysis

Content analysis was used to categorise the open-text responses. Responses to each field (audience, action, item/material) were coded by the lead author (KB) and cross-checked by a content expert within the research team (JM). Thematic categories were identified using an inductive ‘bottom up’ coding approach – starting with verbatim comments and using common expressions to create an initial code frame which was revised and grouped into thematically similar categories (Leavy, 2014). Coded responses across the three fields (audience, action, item/material) were then combined and deduplicated to create a consistent and comprehensive list of behaviours. The final list was then quality checked by a third researcher (JC) to ensure consistency in categorisation and labelling.

2.5. Short-listing methods

Once the long list was identified, the next step was to prioritise a short-list of behaviours which could be taken to future phases of the program. To do this, the collaboration partners first agreed on a set of explicit criteria (prioritisation principle #3) chosen to align with the ambitions of the mission goal. During one of the long-listing workshops (where only collaboration partners were present), participants were asked to brainstorm at least three criteria that could be used for prioritisation. Similar criteria across were then grouped together and participants were asked to vote for the most important criteria. The final criteria included two filters and four rating criteria, shown in Table 1.

Behavioural focus was applied as yes/no criteria during the long-list data cleaning process to ensure that the final list reflected actual behaviours – i.e. observable actions rather than beliefs or interventions. *Policy alignment* was also applied as yes/no criteria to ensure that any focus areas did not contradict policy positions of government partners. The remaining four criteria were taken into the prioritisation summit and rated by participants on a scale from 1 to 5. *Likelihood* referred to the probability that the target audience would adopt the behaviour – i.e. considering the ease/difficulty of the behaviour (mentally, physically, financially, etc). *Time* referred to the speed in which the behaviour could be enacted if an intervention had been designed to address existing drivers and barriers – e.g. the time required for manufacturers to redesign and produce a product to make it more repairable would be longer than the time required for consumers to choose already repairable products. *Impact* referred to the potential contribution of the behaviour to the mission goal, if most of the target audience adopted the behaviour – i.e. recognising that some items and behaviours have a higher material footprint than others. Finally, *system reach* recognised that some actions can have influences beyond the target audience at other levels related to responsible consumption – e.g. the actions of manufacturers can influence the actions of retailers, which in turn can influence consumer

Table 1
Prioritisation criteria.

Type	Criteria	Description	Response options
Filter	Behaviour focus	Is the behaviour an observable and direct action?	Yes/No
	Policy alignment	Does the behaviour directly conflict with collaboration partner’s current and future priorities?	Yes/No
Rating	Likelihood	How likely is it that most of the target audience would adopt this behaviour?	1–5
	Time	How much time would it take the target audience to enact the behaviour?	1–5
	Impact	How much impact would the behaviour have on the mission goal?	1–5
	System reach	How much could the behaviour influence the broader system to change?	1–5

behaviour.

2.5.1. Data collection

The prioritisation summit involved a 2-h online workshop to prioritise up to eight behaviours for further focus and activity. The summit methods were modelled after previous prioritisation forums conducted in healthcare (Bragge et al., 2011, 2021; Clavisi et al., 2013; Jaramillo et al., 2013; Synnot et al., 2018, 2019).

The summit opened with a presentation to establish a shared understanding of the rating criteria and task. This included re-introducing the mission goal, providing an update on the long-listing process and outcomes, and providing a detailed explanation of the prioritisation criteria – with opportunities for clarifying questions. The rest of the summit then focused on the main objective of identifying the priority short list of behaviours through two key activities: 1) a real-time survey to rate the behaviours against the prioritisation criteria; and 2) small group discussions to review the top-rated priorities.

The survey was administered online using Qualtrics. Due to the length of the long-list (see Results section) and limited time available for the summit, a random selection of 22 behaviours were presented to each participant. Participants rated each behaviour against the four criteria: likelihood, time, impact, and system reach. After the survey, results were compiled in real time.

2.5.2. Analyses

As per previous behavioural prioritisation research (Boulet et al., 2023; Kneebone et al., 2017; Selinske et al., 2020), descriptive statistics were used to analyse the results by first calculating the mean scores for each behaviour across each rating criteria, and then visualising the results by plotting the behaviours on two matrices according to the rating criteria. The first matrix was intended to identify the ‘low-hanging fruit’ (i.e. high-likelihood, short-time) behaviours. The second matrix was intended to identify the ‘shoot for the moon’ (i.e. high-impact, high-system reach) behaviours. The ‘short-list’ was then determined by reviewing the behaviours with mean ratings of 4.0 or higher on both relevant criteria in each matrix. While previous behaviour prioritisation research often relies on measures of impact and likelihood alone (Boulet et al., 2023; Kneebone et al., 2017; Selinske et al., 2020), two separate matrices were chosen for this study to align with the mission goal and with recommendations from the initial scoping review (Kaufman et al., 2021b). In other words, we wanted to prioritise a mixture of ambitious and challenging behaviours as well as relatively ‘straightforward’ behaviours that could potentially promote new social norms and/or spill-over effects.

The matrices were presented back to participants during the workshop and used as the basis for small group discussions which were facilitated by members of the research team. The purpose of the group discussions was to provide participants with the opportunity to review the top-rated priorities and consider the relative pros and cons of designing behaviour change interventions targeting such behaviours.

Pearson’s correlation coefficients were used to assess construct validity between the mean scores of the four rating criteria (Ruane, 2005). Based on insights from the scoping review, it was anticipated that likelihood and time would have a positive correlation and impact and system reach would have a positive correlation (convergent validity). It was also anticipated that the relationships across the two matrices (i.e. likelihood/time by impact/system reach) would have either no correlation or possibly a negative correlation – e.g. high system-reach behaviours would likely require a longer time to be enacted. Interrater reliability was assessed using intraclass correlation coefficients (ICC). Given each participant rated a different random set of 22 behaviours (with seven to nine ratings per behaviour), a One-Way Random-Effects Model was used (Koo and Li, 2016) and was generated for each behaviour. All analyses were conducted in SPSS, version 25.

3. Results

This section presents the key findings from the two activities. First, results from the long-listing process are presented, including participant composition, a summary of the thematic categories across audience, action, and material type, and the final ‘long-list’ of unique behaviours. Next, results from the short-listing process are presented, including participant composition, the top behaviours from each matrix, and a summary of the small group discussions. Detailed results for each prioritisation criteria across each behaviour are provided in the Supplementary Material, [Table A1](#).

3.1. Long-listing results

3.1.1. Participant composition

Seventy-seven participants engaged in the long-listing process. The majority of participants were from Victoria (56%) and New South Wales (30%). A further 9% were from Australian Capital Territory, and the remaining 5% were from Queensland, South Australia, or Western Australia. Participants most often worked for the Federal or State governments (35%) and local governments (26%). In addition, 15% were from individual businesses or peak business/industry groups (e.g. retail businesses and repair and recovery enterprises), 14% were from university or research institutes, 6% were from non-government/not-for-profit organisations, and 3% were from another type of organisation. Experience relating to material consumption or waste prevention across the three material types was relatively even – with around one in three

(28%–35%) rating their level of experience as ‘low’, about half (48%–59%) rating their experience as ‘moderate’, and around one in six (13%–18%) rating it as ‘high’.

3.1.2. High-level thematic categories

In total, participants suggested 470 behaviours (mean = 6.1 per participant). [Fig. 2](#) summarises the high-level thematic categories identified across *audience*, *action*, and *material type*. While many actions could be applied to multiple audiences, some were only relevant for certain audiences – such as ‘design’ for manufacturers or designers, and ‘provide’ for retail businesses and manufacturers or designers.

Suggestions covered all three material types – although more behaviours were suggested for fashion and textiles (40%) compared to electronics and electrical devices (31%) and furniture and large household items (24%). The most common high-level categories for action were ‘acquiring circular’ (e.g. acquire durable/repairable items and acquire pre-owned items), and ‘prolonging’ (e.g. maintain/repair items and sell durable items). It is interesting to note that only around one third of suggestions were directly related to consumers (33%), with many suggesting that responsible consumption behaviours can be addressed further up the supply chain (e.g. by retail businesses and manufacturers or designers) or by other actors in the system (e.g. Federal, State, and local governments).

3.1.3. The long list

After deduplication and thematic analysis (i.e. where patterns of similar behaviours and intent were clustered under key themes), 84

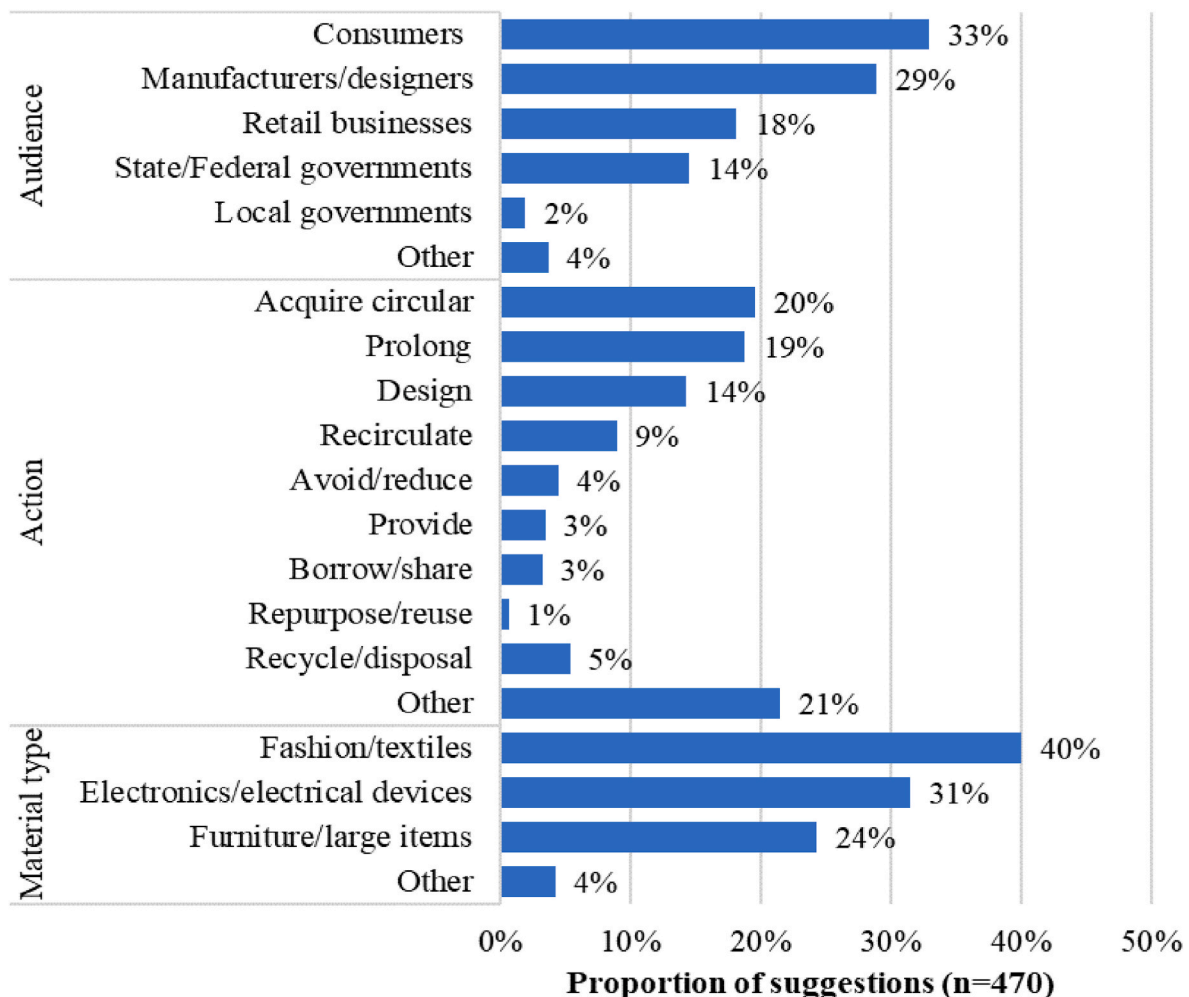


Fig. 2. Thematic categories identified across Audience, Action, and Material type – ordered by frequency of occurrence.

unique behavioural categories were retained and taken to the prioritisation summit – see Table 2. Some behaviours were simplified to increase readability. For example, ‘electronics/electrical devices’ is presented as ‘electrical devices’, ‘fashion/textiles’ is presented as ‘fashion’, and ‘furniture/large household items’ is presented as ‘furniture’. This discrepancy was explained to participants prior to rating.

3.2. Short-listing results

3.2.1. Participant composition

The prioritisation summit was attended by 31 participants – 18 stakeholders from the collaboration partners, and 13 stakeholders external to the collaboration, including representatives from local (n = 7) and regional government organisations (n = 3) and non-government organisations (n = 3). All participants were based in either Victoria (n = 19), New South Wales (n = 8), or Australian Capital Territory (n = 4).

3.2.2. Prioritisation matrices

Results from the summit are summarised in Fig. 3. The numbered points in the matrices correspond with each behaviour from Table 2. Mean ratings (M), standard deviations (SD), and standard errors (SE) for all 84 behaviours by each of the four prioritisation criteria are provided in the Supplementary Material, Table A1. Based on results from the real-time survey, three ‘shoot for the moon’ behaviours were identified (i.e. behaviours with ‘impact’ and ‘system reach’ ratings of 4.0 or higher) and four ‘low hanging fruit’ behaviours were identified (i.e. behaviours with ‘time’ and ‘likelihood’ ratings of 4.0 or higher). These seven behaviours (the short list) were retained for further discussion – see Fig. 3.

3.2.3. Group discussions

Following the prioritisation exercise, group discussions were undertaken during the workshop to capture important contextual or background information about the prioritised behaviours. For example, it was recognised that the prioritised ‘manufacturer’ behaviours, while important, would be difficult for the collaboration partners to design and implement an effective intervention, particularly in a global market. Additionally, the prioritised ‘consumer’ behaviours related to donating and selling pre-owned items were already commonly adopted by many Australians, which could reduce the opportunity to create change. However, it was noted that while common, there were still opportunities to increase adoption and frequency at a larger scale for increased impact. It was also noted that while donation behaviour was widespread, there were issues associated with the ‘useable’ component of the behaviour that warranted action – such as increasing the quality of donated items. Finally, it was recognised that while durability and repair were considered high priorities among the collaboration partners, related behaviours (e.g. ‘designing items for longer life’, or ‘allowing right to repair for electrical devices’) were not among the highest rated priorities within the two matrices.

3.2.4. Validity and reliability

For validity, as anticipated, there was a positive correlation between system reach and impact ($r = 0.756, p < 0.001$) and between likelihood and time ($r = 0.421, p < 0.001$). Also, as expected, there was no relationship between likelihood and impact ($r = 0.053, p = 0.631$) or system reach ($r = 0.029, p = 0.792$). There was also no relationship between time and impact ($r = -0.208, p = 0.057$). There was however, a negative relationship between time and system reach ($r = -0.417, p < 0.001$).

For reliability, ICC values were generated for each of the 84 behaviours and are available in the Supplementary Material, Table A2. ICC values were interpreted as follows: greater than 0.9 indicated excellent reliability, between 0.75 and 0.9 indicated good reliability, between 0.5 and 0.75 indicated moderate reliability, and less than 0.5 indicated poor reliability (Koo and Li, 2016). Overall, five behaviours had excellent reliability, 14 had good reliability, 16 had moderate reliability, and the remainder had poor reliability. Consumer- and government-related

Table 2

Final list of behaviours – the “long list”.

AUDIENCE	ACTION	ITEM/ MATERIAL	#
CONSUMERS ...	avoid/reduce purchasing of ...	electrical devices	1
		fashion	2
		furniture	3
	share (e.g. borrow or rent) ...	electrical devices	4
		fashion	5
		furniture	6
	acquire durable/repairable ...	electrical devices	7
		fashion	8
		furniture	9
	acquire pre-owned ...	electrical devices	10
		fashion	11
		furniture	12
	repurpose old ...	fashion	13
		furniture	14
	maintain/repair ...	electrical devices	15
		fashion	16
		furniture	17
	swap pre-owned ...	fashion	18
		furniture	19
	donate/sell pre-owned (useable) ...	electrical devices	20
		fashion	21
		furniture	22
LOCAL GOVERNMENTS ...	offer borrow libraries for ...	electrical devices	23
		furniture	24
MANUFACTURERS & DESIGNERS ...	design [...] for end of life recovery (e.g. disassembly, modularity, repairability, recyclability)	electrical devices	25
		fashion	26
		furniture	27
	design [...] for longer life (e.g. durability, adaptability, easy maintenance)	electrical devices	28
		fashion	29
		furniture	30
	use recycled materials in ...	electrical devices	31
		fashion	32
		furniture	33
	offer replacement parts for ...	electrical devices	34
		electrical devices	35
	promote “eco-credentials” of [...] (e.g. durability, repairability, material footprint)	electrical devices	36
		fashion	37
furniture		38	
allow right to repair for ...	electrical devices	39	
	electrical devices	40	
offer services that extend the life of [...] (e.g. repair, maintenance, alteration)	fashion	41	
	furniture	42	
	electrical devices	43	
offer customer training to extend the life of [...] (e.g. repair, maintenance, alteration)	fashion	44	
	furniture	45	
provide extended/lifetime warranties for ...	electrical devices	46	
	furniture	47	
offer end of life return/collection for ...	electrical devices	48	
	fashion	49	
	furniture	50	
RETAIL BUSINESSES ...	implement return/reuse/repair business models for ...	electrical devices	51
		fashion	52
	offer replacement parts for ...	electrical devices	53

(continued on next page)

Table 2 (continued)

AUDIENCE	ACTION	ITEM/ MATERIAL	#
		furniture	54
	offer lease/rental services for ...	electrical devices	55
		fashion	56
		furniture	57
	promote "eco-credentials" of [...] (e.g. durability, reparability, material footprint)	electrical devices	58
		fashion	59
		furniture	60
	source [...] that are ethical/sustainable ...	electrical devices	61
		fashion	62
		furniture	63
	offer services that extend the life of [...] (e.g. repair, maintenance, alteration)	electrical devices	64
		fashion	65
		furniture	66
	offer customer training to extend the life of [...] (e.g. repair, maintenance, alteration)	electrical devices	67
		fashion	68
		furniture	69
	provide extended/lifetime warranties for ...	electrical devices	70
		fashion	71
		furniture	72
	sell durable ...	electrical devices	73
		fashion	74
		furniture	75
	offer end of life return/collection for ...	electrical devices	76
		fashion	77
		furniture	78
STATE & FEDERAL GOVERNMENTS ...	enforce warranty procurement policy for ...	electrical devices	79
		fashion	80
		furniture	81
	procure [...] that are ethical/sustainable	electrical devices	82
		fashion	83
		furniture	84

'Other' audiences, actions, and materials and 'Recycle/disposal' actions were considered out of scope and excluded for the summit.

behaviours had better reliability than manufacturer and retailer behaviours – with 12 of the 22 consumer behaviours (55%) and seven of the eight local and State/Federal government behaviours (88%) at least 'moderately' reliable. In contrast, only six of the 25 manufacturer behaviours (24%) and 10 of the 29 retailer behaviours (34%) were at least 'moderately' reliable.

4. Discussion

Using a collaborative prioritisation approach, commonly applied in healthcare, this project identified 84 unique behaviours related to responsible consumption in Australia across three priority material types (fashion and textiles, electronics and electrical devices, and furniture and large household items). From the 'long-list', a 'short-list' of seven behaviours was then identified based on an explicit set of prioritisation criteria – manufacturers design furniture for end of life recovery; manufacturers design electrical devices for end of life recovery; State/Federal governments enforce warranty procurement policy for electrical devices; consumers acquire pre-owned fashion items; consumers donate/sell pre-owned (useable) fashion items; consumers swap pre-owned fashion items; and consumers donate/sell pre-owned (useable) furniture. The methods used to identify and prioritise responsible consumption behaviours were based on established principles of prioritisation (Bragge et al., 2021) and close collaboration between researchers, policymakers, and practitioners.

4.1. Significance of the results

Previous behavioural prioritisation methods often rely on measures of impact and likelihood (Boulet et al., 2023; Kneebone et al., 2017; Selinske et al., 2020). However, by including four prioritisation criteria, and generating two matrices, we were able to identify a mixture of ambitious and challenging 'shoot for the moon' behaviours as well as some relatively straightforward 'low hanging fruit' behaviours. It is worth noting that the prioritised 'low hanging fruit' behaviours were all related to consumers engaging in re-use activities (most of which had good or excellent interrater reliability), whereas two of the three prioritised 'shoot for the moon' behaviours were related to manufacturers designing products for end-of-life recovery (both of which had poor reliability).

Together, the behaviours represent two different places to 'intervene' in the integrated system of production and consumption (Macklin et al., 2023; West et al., 2020). The inclusion of business/industry behaviours alongside consumers is important, because voluntary 'responsible' consumer action alone is insufficient (and can potentially backfire) without broader system change, requiring behaviour change of 'structural actors' (like manufacturers) as well as consumers (Lunetto et al., 2022; O'Rourke and Lollo, 2015). This finding aligns with prior research which has identified that the actions of others (e.g. governments, retailers) are greater enablers of responsible consumer behaviour because they also enable others within the system (Balan, 2021; Sheoran & Kumar, 2020). However, it is important to acknowledge that manufacturer and retailer behaviours had less consistent ratings from participants across the four criteria, indicating less agreement between experts. This suggests that less may be known about these actors from a behavioural perspective and that additional research and knowledge sharing regarding the behaviour of businesses is required for experts to make more reliable judgements.

Identifying and prioritising behaviours with broader system reach, longer time frames and higher impact provides a strategic, system change agenda for sustainability policy behaviour change in this domain that previously has been lacking (Aslam and Ghouse, 2023; Baum and Gross, 2017), while still identifying those crucial 'low hanging fruit' that can build credibility and momentum for policy and program reform. To our knowledge, these beneficially in tension aspects have not been successfully operationalised into a participatory, evidence informed decision making process linking research, policy and practice before now. As such, this project is a novel, practical example of behavioural public policy for transitions (Kaufman et al., 2021a).

Another key strength of our approach was the application of prioritisation methods to a real-world behaviour change challenge. Findings indicate that there are 84 behaviours – across five target audiences – that need to be adopted (or scaled up) for Australia to achieve its goal of decreasing material resource consumption. The sheer amount of resources and time required to effectively tackle 84 behaviours at a national, and in some cases international scale, would be immense and unpractical. This is why behaviour prioritisation is so important to address complex environmental problems. Additionally, a key contribution of this process was the collaborative identification of prioritisation criteria. This ensured that the final list would be relevant to all collaboration partners, and would assist in contributing to the ambitions of the wider mission goal. By consulting a diverse range of experts, and rating the behaviours against a set of explicit prioritisation criteria, we were able to reduce the long list to the top seven behaviours for targeted intervention design. The long-list also provides a valuable resource for future initiatives, such as exploring the relationship between the identified audiences and actions, providing a 'behavioural map' for potential multi-level intervention design – such as targeting several 'repair' behaviours across multiple audiences.

Another key strength of this project was the adoption of a consultative approach with a wide array of relevant stakeholders. Partnerships and collaborations between researchers, policymakers, and industry are

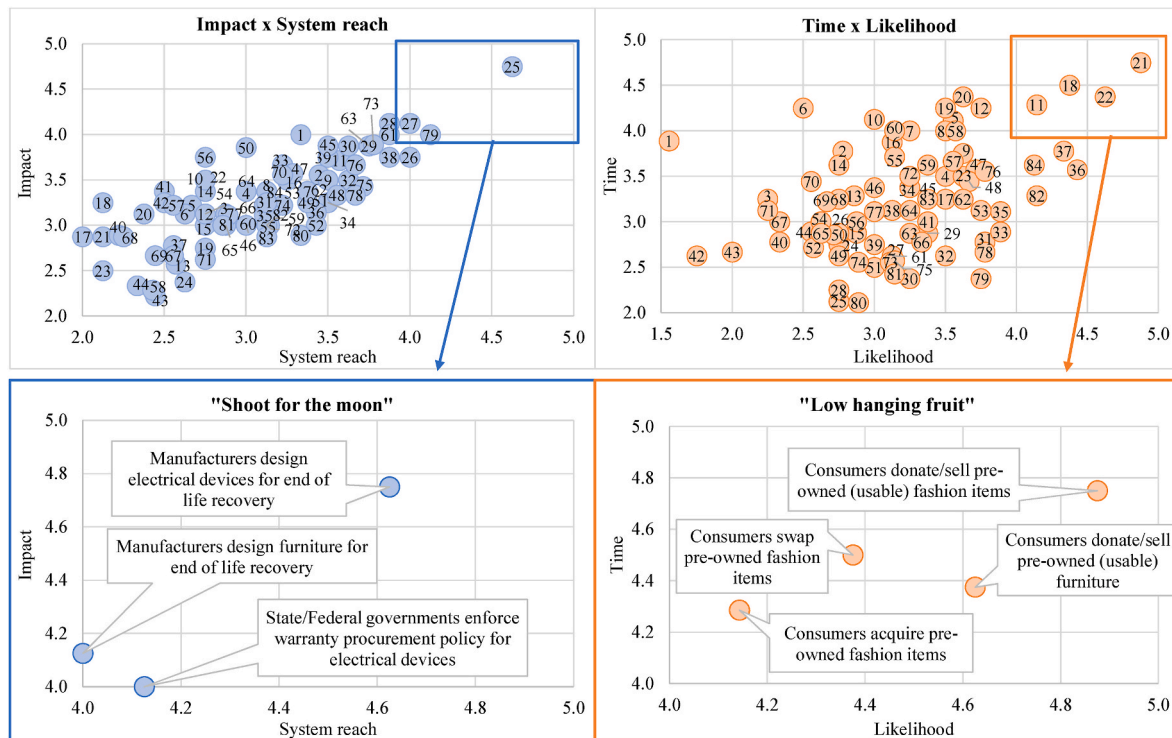


Fig. 3. Summary of summit ratings – Top left: Impact by System reach, all behaviours; Bottom left: highest rated on Impact and System reach, i.e. ‘shoot for the moon’ behaviours; Top right: Time by Likelihood, all behaviours; Bottom right: highest rated on Time and Likelihood, i.e. ‘low hanging fruit’ behaviours.

essential for tackling behavioural problems (Oliver and Cairney, 2019; Western, 2019). However, even in healthcare research (where prioritisation is more common) priority setting processes that involve governments and policymakers are lacking (Fadlallah et al., 2022). By drawing from the collective experience of a variety of academic and non-academic experts in material consumption and waste prevention, we were able to identify behaviours that could contribute to responsible consumption in Australia, that would also be practical and realistic to target through behavioural interventions. For example, while it was highlighted that some of the ‘low-hanging fruit’ behaviours related to buying and donating pre-owned items were already common (suggesting they may not be worth targeting), it was also raised that such behaviours provided a potential leverage point for encouraging behaviour change at scale, and therefore should not be discounted as potential targets.

4.2. Implications for practice

The results from the prioritisation activities and the discussions that followed suggest several opportunities for practical initiatives in the future. First, while many consumers already engage in some of the ‘low hanging fruit’ behaviours (i.e. acquiring and recirculating pre-owned fashion/textiles), there is an opportunity for practitioners and policymakers to build on existing momentum and encourage adoption across more mainstream audiences. This could be facilitated by implementing multi-level interventions which take into account multiple actors within the wider system – e.g. second-hand collectors, repair/refurbishment services, second-hand sellers, and consumers. Second, carefully designed behaviour change interventions could target multiple ‘low hanging fruit’ behaviours while also addressing existing behavioural problems – e.g. second-hand charities could design interventions that encourage purchasing of pre-owned fashion as well as high-quality donations, while deterring illegal dumping of unwanted goods.

Finally, practitioners and policymakers with the capacity to intervene in the global market could develop interventions that target some

of the prioritised ‘shoot for the moon’ behaviours (i.e. manufacturers design furniture and electrical devices for end of life recovery). For example, environmental advocacy organisations could coordinate an international advocacy campaign demanding that large manufacturing companies design their electrical devices for longevity, including repair and recovery.

4.3. Limitations & future research

In addition to its strengths, this study also had several limitations worthy of discussion. First, the use of convenience recruitment methods may have biased the participating sample. For example, over half of participants in the ‘long-listing’ process worked in local or State governments and lived in the state of Victoria (where most of the collaboration partners are based). However, it is encouraging to note that expertise across the different materials was relatively even, suggesting a diversity of experience. It is also notable that participants in the long listing process were more diverse than the short-listing process. For example, the summit did not include any attendees from peak business/industry groups, community organisations, or individuals residing outside of New South Wales, Victoria, or the Australian Capital Territory. This may partially explain the poorer reliability ratings for manufacturer and retailer behaviours.

Additionally, due to the online format and relatively short time (2-h) for the summit, it was difficult to balance the objectives of generating a shared understanding, rating 84 behaviours across four criteria, and discussing the challenges and opportunities associated with the prioritised behaviours. While efforts to mitigate this tension were made (such as presenting each participant with a random selection of behaviours from the long list), we recognise the importance of carefully considering the optimal balance between activities in such events. Finally, the priority ‘low hanging fruit’ and ‘shoot for the moon’ behaviours discussed in this paper are only one way of identifying behaviour change priorities. Additional analysis of the ratings could be undertaken, such as reviewing behaviours slightly outside the upper extremes of the

matrices, or reviewing the total aggregate scores across all four criteria.

5. Conclusion

The aim of this project was to use a collaborative prioritisation approach to identify and prioritise behaviours related to responsible consumption in Australia. The prioritised 'short-list' included three 'shoot for the moon' behaviours (representing challenging and ambitious actions) and four 'low hanging fruit' behaviours (representing opportunities to promote new social norms and/or spill-over effects). This project demonstrates the value of adopting a collaborative and inclusive approach to identifying priorities for potential behaviour change interventions which could promote responsible consumption in Australia. By engaging with a variety of internal and external stakeholders, the project was able to leverage the collective knowledge and expertise of academics, policymakers, and practitioners. Ultimately, this approach will help apply behavioural public policy to contribute to reducing material resource consumption in Australia in a manner that is impactful with transformative potential, but also practical and realistic to implement.

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CRediT authorship contribution statement

Kim Borg: Writing – review & editing, Writing – original draft, Visualization, Project administration, Methodology, Formal analysis, Data curation. **Jennifer Macklin:** Writing – review & editing, Project administration, Methodology, Formal analysis. **Stefan Kaufman:** Writing – review & editing, Validation, Funding acquisition, Conceptualization. **Jim Curtis:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.clrc.2024.100181>.

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