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Unpacking publics' disengagement and information behaviors: Roles of psychological distance, feasibility and desirability in an environmental sustainability issue

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ABSTRACT

Despite the prominence of global environmental challenges, promoting publics' engagement with issues related to environmental sustainability has proven difficult. Publics have perceived them as distant issues that do not have imminent impact requiring immediate actions. However, publics' disengagement has in turn accelerated environmental deterioration. Applying construal level theory, this study explores factors that cause publics' disengagement but also ways to promote information behaviors in an environmental sustainability issue. An online survey was conducted of a nationally representative sample of 507 Australians in November 2022. Using food waste as an issue that negatively affects environmental sustainability, structural equation modeling was conducted to test the effects of the dynamics of psychological distance, feasibility, and desirability on publics' disengagement, information seeking and information forwarding. When individuals consider food waste a distant issue, they also consider it to be undesirable and infeasible to act upon, with the result that they disengage. However, this study finds that while psychological distance is negatively associated with desirability and feasibility, it is positively associated with information seeking and forwarding. We find, in particular, that desirability positively contributes to information seeking and forwarding. However, feasibility is negatively associated with information seeking and forwarding. Implications for public relations theory and practice are discussed (203 words).

1. Introduction

Behavioral change by individuals and households is considered important if environmental sustainability is to progress (Rau et al., 2022). Pro-environmental behaviors are conscious behaviors that individuals engage in to minimize the negative impact of their actions on the world (Kollmuss & Agyeman, 2002). To date, various interventions to promote pro-environmental behaviors have been tested among individuals and households, including the provision of information to increase awareness, and the adjustment of government policies to provide incentives (Rau et al., 2022). Despite these efforts, most interventions have resulted in short-term and minimal positive effects; numerous barriers remain to achieving large-scale change toward pro-environmental behaviors (Rau et al., 2022). Notably, it has been found that individuals who lacked the willingness to change before such interventions were not receptive to the interventions. As such, it is critical to understand the processes that individuals undergo before changes in pro-environmental attitudes and behaviors are forthcoming (Liao et al., 2016). In this light, the significance of publics' disengagement and information behaviors should be further explored (Moreira et al., 2022; Yoo et al., 2018).

To authors' knowledge, this is one of the rare papers that focus on publics' disengagement within public relations research. To date, there is ample communication research that explores organizational and individual factors that affect publics' engagement (Dhanesh, 2017; Kang & Sung, 2017; J.-N. Kim & Grunig, 2011; S. Kim, 2022; Shen & Ren, 2023a, 2023b). However, there is still a dearth of research in public relations that provides "in-depth exploration and understanding of dynamics and complexities of engagement and disengagement" (Jelen-Sanchez, 2017, p. 942). Pasadeos et al. (2010) noted that the public relations discipline "could denote more attention to audiences and stakeholders who not only receive communications from organizations but who are able today

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to rapidly communicate and interact with organizations and publics" (p. 153). We believe this should be extended to understanding publics' disengagement. Research in public relations has examined engagement and disengagement only in the employee context (Kang, 2014; Lemon & Palenchar, 2018). In addition, Taylor and Kent (2014) have pointed out that engagement has mostly been researched by scholars from an organizational perspective. As Shen & Ren, (2023a,2023b) have suggested, "There is little evidence of a shift in attention from (powerful) organizations to publics and public engagement in public relations discipline" (p. 937). This argument extends to research on publics' disengagement. More scholarly attention is needed to better understand how and why publics' disengagement happens, especially in areas that need public engagement, such as environmental sustainability. Shen & Ren, (2023a, 2023b) highlighted the need for research on disengagement "to explore the nature, components, triggers, and outcomes of disengagement before we seek to investigate the dynamic interactions between engagement and disengagement" (p. 2).

Facilitating public engagement with issues related to environmental sustainability has proven difficult because they have been considered distant issues posing no imminent threat (Weber, 2010). One of the biggest challenges has been that the impacts of environmental issues such as climate change have not necessarily been readily observable (Chu, 2022). As a result of not being able to see and feel the imminent threat, publics have displayed high levels of disengagement with environmental sustainability issues, showing mental withdrawal and resistance to change (Skinner et al., 2009). Disengagement refers to deliberate attempts to reduce commitment and stop making efforts, such as investing time and energy, toward a targeted goal (Moreira et al., 2022). Publics' cognitive, emotional, and behavioral disengagement from issues of significant impact on society is a growing concern for policymakers (Bowden et al., 2016). Without publics' engagement, the negative impact of human behaviors on environmental sustainability could worsen.

In this light, Canel (2023) urged public relations scholars to consider sustainability "an urgent priority" (para. 5) in their research and called for public relations research to address the issue of sustainability from diverse, interdisciplinary perspectives in contribution to the United Nations 2030 Agenda for Sustainable Development. Thus, this study proposes to test a theoretical framework that predicts publics' disengagement and information behaviors related to an environmental sustainability issue based on the construal level theory (CLT) of psychological distance (Liberman & Trope, 1998). CLT explains how far or close people perceive an object or an issue to be from themselves in terms of spatial, temporal, social and probabilistic distances (Chu, 2022). For example, individuals living in developed countries may fail to recognize the threat posed by environmental issues such as climate change because it is likely to more severely affect people in developing countries (i.e., spatial distance) in a few decades' time (i.e., temporal distance). As Chu (2022) notes, impacts of environmental risks cannot be felt personally by individuals in different locations and at different times; understanding individuals' mental construal and its impact on factors such as perceived feasibility and desirability may shed light on how they make environment-related decisions such as whether and how they disengage with the risks. Due to the complexity of environmental issues, the current lack of research on how people construe issues related to environmental sustainability needs to be addressed (Chu, 2022).

This paper tests the influence of these dynamics on publics' disengagement, information seeking and information forwarding in relation to food waste. Disengagement, information seeking, and information forwarding were chosen to be tested as outcome variables from a communication perspective for the following reasons. Psychological distance, feasibility and desirability have been found to gradually shift views but do not lead to an immediate increase in pro-environmental behaviors (Wang et al., 2021). These findings reflect an opportunity to explore publics' information behaviors (rather than pro-environmental attitudes and behaviors) as possible factors in the psychological mechanisms resulting from the dynamics of psychological distance, desirability, and defeasibility. As individuals engage in information behaviors to work toward solving the problematic issue, their views may shift or become reinforced, ultimately motivating changes in behavioral intentions toward the issue (Yoo et al., 2018).

Rather than examining pro-environmental attitudes and behaviors, examining disengagement and information behaviors could reveal it to be a crucial factor that explains how publics make sense of environmental issues. The findings of this study will advance current understanding on how individuals' evaluations of the concreteness and abstractness of an issue affect their judgments and behaviors related to the issue. By applying CLT as a psychological theory to examine disengagement, this research aims to respond to Canel's (2023) call for the "public relations-imperative for sustainability" and to contribute to the body of research investigating "whether and how public relations can add value to society" (Heath, 2006, p. 95). Explaining public's disengagement and information behaviors in sustainability-related issues will contribute to the body of knowledge in public relations literature in the context of sustainability as well as to the corporate sustainability communication practices, where corporate sustainability has become "an integrative part of the business strategy in many companies" (Signitzer & Prexl, 2008, p. 3). As many public relations and communication professionals are now expected to engage with stakeholders as part of corporate sustainability processes (Signitzer & Prexl, 2008), acquiring stakeholder and public insights is crucial in those processes.

2. Literature review

2.1. Psychological distance

In everyday life, people make judgments and decisions about events or issues that will happen in the near or distant future (Liberman & Trope, 1998). Because events happening in the near future tend to have concrete features or substances, it is easier for people to make decisions about and act on them (Trope & Liberman, 2010). By contrast, distant future events tend to have abstract features, and such abstractness requires high levels of construal to process, comprehend and interpret meanings and consequences (Liberman & Förster, 2009; Trope & Liberman, 2010). In this light, CLT explains the underlying processes on which individuals base their judgments and decisions about future events.

To explain in more detail, CLT posits that when individuals perceive an object to be distant (i.e., distal objects), they mentally process it at an abstract level; and when they perceive it to be urgent (i.e., proximal objects), they mentally process it at a concrete level (Liberman & Förster, 2009; Young, 2015). According to Jones et al. (2017), CLT explains how individuals engage with future objects or events such that the increase in psychological distance results in the objects or events being construed in "more abstract, decontextualized and generalized terms" (pp. 331–332). In contrast, when psychological distance is reduced, the objects or events are construed to be "more concrete, contextualized, and detailed" (Jones et al., 2017, p. 332). Psychological distance has four dimensions: geographic (i.e., spatial distance), temporal (i.e., time), social (i.e., perceived similarities between self and the other) and uncertainty (i.e., perceived likelihood of an event) (Liberman & Trope, 1998; Trope & Liberman, 2010). The mental representations associated with these four dimensions are critical for individuals to plan possible courses of actions for the future (Trope & Liberman, 2010).

In the context of climate change, Jones et al. (2017) found that psychological distance for the temporal, social and uncertainty dimensions is significant in predicting concerns. However, a review by K. Kim (2023) that applied CLT to the study of climate change found that climate change concerns did not consistently translate to publics' pro-environmental intentions or behaviors, and noted the importance of examining relevant mediators and moderators. Meanwhile, Wang et al. (2021) noted that individuals can be motivated to engage in actions for

distant events like climate change when some immediate goals, and the means to achieve those goals, are made available. In reality, psychological distance may also serve an important adaptive function for individuals as they seek to reduce negative emotions toward seemingly distant events such as climate change.

The complex nature of psychological distance has been repeatedly identified as an influential factor warranting investigation for the psychological mechanisms that predict individuals' engagement, disengagement, and behavioral intentions, especially in relation to complex issues like climate change (Brügger et al., 2016; Chu, 2022; K. Kim, 2023). To date, CLT has been applied to a variety of different contexts; K. Kim (2023) identified 68 articles applying CLT to the study of climate change between 2010 and 2021 alone. Although it is generally believed that reducing the psychological distance between an object or event and a perceiver is critical to achieving a desirable outcome such as affecting climate change–related behaviors, the results are conflicting (K. Kim, 2023). Moreover, psychological distance is not necessarily negative. Some studies have shown correlations between psychological distance and mitigation and adaptation behaviors toward climate change, such that higher distance motivates such behaviors (Maiella et al., 2020). Brügger et al. (2016) argued that decreasing psychological distance would not necessarily alter behavioral intentions or behaviors but would change the underlying processes on which individuals base their decisions. Thus, further research into these underlying processes in various contexts is needed. To date, the application of CLT to public relations has been limited to the context of crisis communication (Huang & Ki, 2023; S. Kim, 2022).

2.2. Desirability and feasibility

Because current research applying CLT to the context of climate change has resulted in conflicting results, there have been calls to include relevant mediators and moderators (Chu, 2022; K. Kim, 2023). Furthermore, as psychological distance does not automatically alter actions but rather decision-making processes, it is worth understanding how psychological distance might affect those processes (Brügger et al., 2016). Of note, feasibility and desirability have been proposed as possible important mediators that result from psychological distance and affect individuals' decisions and actions in response to an object or an event (Liberman & Trope, 1998). Desirability is defined as "the valence of an action's end state," examining the "why" aspect of an action (Liberman & Trope, 1998, p. 7) and the value of the end state (Yan et al., 2016). Feasibility is defined as the "ease or difficulty of reaching the end state," reflecting the "how" aspect of an action (Liberman & Trope, 1998, p. 7), in terms of how to reach the end state (Yan et al., 2016). Desirability is important and influential when individuals process distant, future objects or events; it requires high-level construal (Liberman & Trope, 1998). On the contrary, feasibility is more important to proximal objects or events and requires low-level construal (Liberman & Trope, 1998).

Psychological distance affects the underlying mechanisms on which decisions are based about an object or event; two of the considerations affected are desirability and feasibility (Liberman & Trope, 1998; Lu et al., 2013). Liberman and Trope (1998) found that desirability considerations were weighted more heavily than feasibility considerations in distant than near future decisions, and posited that this could be caused by a lack of available and reliable information regarding the feasibility of distant, future events (Bandura, 1986; Kilian & Mann, 2020). At the same time, a lack of available and reliable information might also explain why distant, future events are processed at an abstract level (Liberman & Trope, 1998). Due to this unavailability, individuals would logically consider desirability first by asking "What is my goal?" and feasibility second by asking "How do I get there?" (Liberman & Trope, 1998). Sagristano et al. (2002) also suggested that desirability and feasibility considerations are asymmetric in people's decisions and considerations. Similar findings of weighting or preferring desirability over feasibility have been reported in other studies (e.g., Baskin et al., 2014; Fujita et al., 2006; Liberman et al., 2002; Todorov et al., 2007). Liu (2008) reported that when decisions involve desirability and feasibility conflicts, people tend to favor highly desirable options, such as high-risk, high-reward options.

Carrera et al. (2020) took further steps to explain the dynamics of psychological distance and desirability in influencing individuals' behavioral intentions in an abstract mindset. They found that individuals in an abstract mindset reported a greater willingness and commitment to attempt desirable but demanding behaviors than those in a concrete mindset. Based on these findings, Carrera et al. (2020) suggest that an abstract style of thinking enhances people's intentions to perform desirable but demanding actions. Similarly, Fernández et al. (2018) study found that individuals with higher levels of abstraction, cross-situational consistency and self-control reported greater intentions to engage in a desired healthy action. Extending this connection between abstraction and desirability to the present study, this study predicts that when individuals perceive environmental sustainability issues as psychologically distant, they will perceive those issues as abstract but, at the same time, desirable and challenging. Therefore, perceived psychological distance may lead to perceived desirability (see H1, below).

Meanwhile, even if certain issues or events are considered desirable, not all individuals would act on them due to the level of feasibility of taking such actions. People may consider self-interest (e.g., price, convenience, saving time and effort in making changes) over social benefits (e.g., sustainable consumption) as part of evaluating the desirability and feasibility of future events or issues. Baskin et al. (2014) suggest that feasibility refers to the convenience and ease of learning how to do something. When future issues or events are perceived to be distant, this may decrease personal relevance to those issues or events and lead to less systematic and more heuristic processing (Fujita et al., 2008). Benschop et al. (2021) found that low construal level is related to high perceived importance of feasibility relative to desirability and, in turn, leads to people being less willing to continue a course of action. Because psychologically distant issues or events require high construal levels, they would be related to low levels of feasibility. Therefore, when individuals see sustainability-related issue(s) as distant future issues, they may see them as unfeasible (H2).

H1. : Psychological distance is positively associated with desirability.

H2. : Psychological distance is negatively associated with feasibility.

2.3. Disengagement

In the context of sustainability development perceived as a future-oriented issue, Moreira et al. (2022) advocated for "an integrative framework" for conceptualizing engagement and disengagement (p. 1). There has been much research explaining and predicting individuals' sustainable behaviors (F. G. Kaiser & Byrka, 2011; Nielsen et al., 2021; Nisbet et al., 2008; Nisbet & Zelenski, 2013). But scholarly and empirical research on individuals' engagement and disengagement with issues related to environmental sustainability remains limited. Moreira et al. (2022) argued that there is a need to identify psychological mechanisms that "shape how individuals experience and relate to their external environments and influence sustainable behavior broadly over time" (p. 2). In addition to examining engagement, it is also crucial to identify psychological mechanisms that explain disengagement.

Disengagement is defined as "the process of withdrawing one's engagement" and "intentionally reducing and eventually stopping effort and commitment (time and energy) toward a target goal" (Moreira et al., 2022, p. 3). It refers to individuals' intentional strategies to distance themselves from unattainable goals (Afrahi et al., 2022). It should be differentiated from the passivity of merely lacking engagement or the absence of engagement (Skinner et al., 2009). Several scholars have noted that disengagement has been often treated as an absence of engagement and that such treatment is "a misapprehension of the nature

of disengagement" (Afrahi et al., 2022, p. 1). It is to be reiterated that disengagement is an active process of withdrawing engagement, at cognitive, emotional, and behavioral levels. There have been calls for further research to investigate why and how disengagement occurs (Wollard, 2011).

Like engagement, disengagement is a multidimensional construct with cognitive, affective, and behavioral components. In the context of sustainability issues, cognitive disengagement refers to "maladaptive beliefs and appraisals about sustainability development" (Moreira et al., 2022, p. 4). Emotional disengagement is defined as "the dissatisfaction and maladaptive affective reactions toward sustainable development" (Moreira et al., 2022, p. 4). Behavioral disengagement is defined as "withdrawal of behavioral involvement with sustainable behavior and/or involvement in unsustainable behavior" (Moreira et al., 2022, p. 4). Following Moreira et al.'s (2022) definitions, for the purposes of this study, disengagement in sustainability issues is conceptualized as individuals' deliberate attempts to distance themselves emotionally, cognitively, or physically from sustainability issues by reducing their commitment and ceasing efforts toward desired sustainability goals.

It is generally assumed that psychological distance would directly predict disengagement with an object or an event, as events or objects with great psychological distance are perceived as less probable (Wakslak et al., 2009). By contrast, proximal objects or events are likely to be perceived as more certain and, in turn, people are more likely to take action (Jones et al., 2017). Brügger et al. (2016) noted the importance of acknowledging the complex influence of psychological distance and the underlying psychological mechanisms that predict disengagement, including the possible influence of psychological distance on desirability and feasibility considerations. As such, the mediating roles of desirability and feasibility between psychological distance and disengagement should be tested. Therefore, the following hypotheses are proposed:

H3. : Psychological distance is positively associated with disengagement.

H4. : Desirability is negatively associated with disengagement.

H5. : Feasibility is negatively associated with disengagement.

2.4. Information seeking and information forwarding

The complex nature of psychological distance has been repeatedly identified as an influential factor that warrants investigation into the psychological mechanisms that predict individuals' engagement, disengagement, behaviors, and behavioral intentions, especially in relation to complex issues like climate change (Brügger et al., 2016; Chu, 2022; K. Kim, 2023). This complexity has led to conflicting findings. Instead of examining changes in behaviors and behavioral intentions, Brügger et al. (2016) also noted the possible influence of psychological influence on individuals' information behaviors. For example, individuals may wish to seek and consume more concrete information for distal objects or events that are mentally represented at an abstract level. In other words, they may demonstrate intentions to reduce psychological distance from a distal object or issue.

In relation to this, Kim and Grunig (2011) posited that individuals engage in information behaviors when they perceive an issue to be problematic to them and decide to narrow the gap between their expectations and experiences. They do so by obtaining new information (i.e., information seeking) and forwarding relevant information to others so that others also understand the issue. Their proposition is founded on the assumption that human behaviors are motivated by a need to solve problems and that problem solvers have heightened activeness in information behaviors when confronting with problems (J.-N. Kim & Grunig, 2011). Information acquisition and transmission are widely used in measuring individuals' information behaviors (Wang et al., 2021; Yoo et al., 2018). Information seeking is characterized as an active information behavior that reflects the planned scanning of the environment for information about a topic (J.-N. Kim & Grunig, 2011). Information forwarding is characterized as an active behavior to forward information to others even if they have not asked for it (J.-N. Kim & Grunig, 2011). The purpose of such active behaviors is to gather evidence to guide actions and to promote similar problem perceptions and/or preferred solutions to others (J.-N. Kim & Grunig, 2011, 2021). Ultimately, information behaviors reflect efforts for cognitive reasoning to solve problems which may result in one's views being created, shifted, or reinforced (J.-N. Kim & Grunig, 2021). Aligning with existing research on CLT that has examined behavioral intentions as outcome variables (K. Kim, 2023), this study operationalizes information acquisition and transmission as individuals' behavioral intentions to search and transmit information about a future-oriented issue.

Given conflicting results regarding the influence of psychological influence on behaviors or behavioral intentions, this study posits that it is crucial to understand individuals' disengagement and information behaviors (Wang et al., 2021). The information consumed and used by individuals could be a critical step to influencing pro-environmental attitudes and behaviors (Liao et al., 2016). In the context of health, Yoo et al. (2018) also found the significance of information behaviors prior to behavioral changes. These findings reflect an opportunity to explore information behaviors (rather than pro-environmental attitudes and behaviors) as possible factors in the psychological mechanisms resulting from the dynamics of psychological distance, desirability, and feasibility. The following hypotheses are proposed:

H6. : Psychological distance is positively associated with information seeking.

H7. : Psychological distance is positively associated with information forwarding.

H8. : Desirability is positively associated with information seeking.

H9. : Desirability is positively associated with information forwarding.

H10. : Feasibility is positively associated with information seeking.

H11. : Feasibility is positively associated with information forwarding.

3. Methods

3.1. Data collection

An online survey of a nationally representative sample of the Australian population was conducted in November 2022. We selected Australia because there have been growing concerns regarding sustainability in that country. Australia ranks 40th of 166 United Nations member countries in terms of sustainable development goal (SDG) performance, with improvements needed in several areas, including climate action(Sustainable Development Report, 2023).

Of the sustainability issues Australia has been confronting, food waste is one of the most serious. It is estimated that Australians waste approximately 7.6 million tonnes of food each year, averaging 312 kg per person and accounting for 3 % of the country's greenhouse gas emissions (McNaughton & Hynninen, 2023). To combat food waste, there have been calls for the Australian Government to do more to reach its goal of halving food waste by 2030 to meet the SDGs set by the United Nations (Hollingworth & Berlage, 2023). Thus, food waste was selected as an issue related to environmental sustainability to be tested in the survey.

Survey participants were recruited via Qualtrics. A total of 507 individuals completed the survey. Quotas related to age, gender, and area of usual residence (i.e., Australian state/territory) were included to ensure the sample reflected the distribution of Australia's population in accordance with census data (Australian Bureau of Statistics, 2016) (Tables 1, 2 and 3).

Table 1
Distribution of Sample by Age.

Age group	Frequency	Percentage
18–24	59	11.6
25–34	96	18.9
35–44	93	18.3
45–54	77	15.2
55–64	68	13.4
65 and older	114	22.5
Total	507	100.0

Table 2
Distribution of Sample by Gender.

Gender	Frequency	Percentage
Male	240	47.3
Female	264	52.1
Nonbinary/third gender	1	.2
Prefer to self-describe	1	.2
Prefer not to disclose	1	.2
Total	507	100.0

Table 3
Distribution of Sample by Area of Usual Residence.

State	Frequency	Percentage	Valid Percentage
New South Wales	169	33.3 (31.36 %)	33.4
Victoria	124	24.5 (25.52 %)	24.5
Queensland	101	19.9 (20.4 %)	20.0
South Australia	34	6.7 (6.98 %-)	6.7
Western Australia	53	10.5 (10.88 %)	10.5
Tasmania, Northern Territory, or the Australian Capital Territory	25	4.9 (2.7 %)	4.9
Total	506	99.8	100.0
Missing	1	.2	
Total	507	100.0	

3.2. Survey procedures

After providing their age and gender, the survey participants were exposed to a vignette regarding the issue of food waste (see Appendix) and asked to evaluate the extent to which they found the issue to be distant, abstract and urgent (i.e., psychological distance), the extent to which they found reducing food waste to be desirable for their life and for Australia (i.e., desirability) and the extent to which they found reducing food waste to be feasible, actionable and attainable (i.e., feasibility). For the endogenous variables, they were asked to evaluate the extent to which they would actively search for information (i.e., information seeking) and forward information to others (i.e., information forwarding) about the issue of food waste. For disengagement, they were asked to evaluate the extent to which they refused to stay informed about the issue (i.e., cognitive disengagement), to care about it (i.e., emotional disengagement) or to participate in discussions about it (i.e., behavioral disengagement).

3.3. Measures

All measurement items of the following five constructs used a 5-point Likert scale from strongly disagree to strongly agree. The survey items are shown in Table 4. For psychological distance, three items were adapted from current literature (Trope & Liberman, 2010; Young, 2015). For desirability, which was measured as the extent to which individuals believed reducing food waste to be desirable, three items were adapted from existing literature (Liberman & Trope, 1998). Feasibility was measured as the extent to which individuals believed reducing food waste to be feasible, and used three items from existing literature (Liberman & Trope, 1998). Disengagement was measured with three items adapted from existing literature (Afrahi et al., 2022;

Table 4
Summary of Measurement Items, Means, Standard Deviations, and Reliability Estimates.

Variable (Cronbach's alpha)	Item	Cronbach's alpha if item deleted	Mean	SD
Psychological distance (α = .841)	I find the issue of food waste distant to me.	.733	2.93	1.194
	I find the issue of food waste abstract to me.	.810	2.92	1.092
	I find the issue of food waste not urgent to me.	.792	2.75	1.260
Desirability (α = .730)	Reducing food waste is good because it will pay off later in life.	.679	3.99	.886
	Reducing food waste is one of the most important principles of my life.	.649	3.71	1.055
	I understand that reducing food waste is crucial to Australia's future.	.601	3.90	.881
Feasibility (α = .821)	Reducing food waste is feasible.	.787	4.04	.810
	Reducing food waste is actionable.	.699	4.10	.786
	Reducing food waste is attainable.	.771	4.16	.756
Information seeking (α = .901)	I would actively search for information about the issue of food waste.	.858	3.33	1.087
	I would regularly check to see if there is new information about the issue of food waste.	.851	3.24	1.073
	I would request information about the issue of food waste.	.865	3.28	1.106
Information forwarding (α = .899)	I would seek out opportunities to share with others my thoughts about the issue of food waste.	.872	3.33	1.082
	I would frequently and confidently express my views about what should be done about the issue of food waste.	.867	3.35	1.063
	I would enjoy opportunities to educate others about the issue of food waste.	.860	3.30	1.079
	It is worth spending time persuading others about the issue of food waste.	.880	3.47	1.032
Disengagement (α = .870)	Staying informed about the issue of food waste would be too much trouble (cognitive disengagement).	.820	2.97	1.124
	I don't care much about the issue of food waste (emotional disengagement).	.807	2.86	1.198
	Participating in discussions about the issue of food waste would be a hassle (behavioral disengagement).	.822	2.96	1.124

Moreira et al., 2022). Lastly, information seeking and information forwarding were measured with three and four items respectively, adopted from Kim and Grunig (2011).

3.4. Data analysis

To ensure reliability, Cronbach's alphas for all measurement items were calculated using IBM SPSS version 28. All variables were greater than.70, with the lowest being.901 and the highest.730 (see Table 4). Bicorrelations were also tested among items (see Table 5). As for newly developed items suited to the context of food waste (i.e., psychological distance, desirability, and feasibility), exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted. Then, structural equation models (SEM) were tested using IBM AMOS version 28 to examine the proposed hypotheses and explain the three dependent variables (i.e., disengagement, information seeking, and information forwarding[1]). Next, structural equation models (SEM) were tested using IBM AMOS version 28 to examine the proposed hypotheses and explain disengagement as a dependent variable. Maximum likelihood procedures were used for the data analysis. For missing data, expected maximization imputation was used. In assessing model fit, Hu and Bentler's (1999) joint criteria were used, whereby a comparative fix index [CFI] $>$ .95, standardized root mean square residual [SRMR] $\leq$ .10 or root mean square error of approximation [RMSEA] $\leq$ .06 reflect a good fit. Standardized coefficients are reported.[1]

3.5. EFA and CFA testing

For psychological distance, desirability, and feasibility, EFA was first run using principal component analysis (PCA) using IBM SPSS version 28. For psychological distance, the Kaiser–Meyer–Olkin value was.718, exceeding the recommended value of.6 (H. F. Kaiser, 1974), and Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance (χ^2 [*df*] = 632.193[3]). PCA revealed the presence of one component with eigen values exceeding 1, explaining 76.114 % of the variance. Desirability had a Kaiser–Meyer–Olkin value of.680, exceeding the recommended value of.6 (H. F. Kaiser, 1974), and Bartlett's Test of Sphericity (Bartlett, 1954) showed statistical significance (χ^2 [*df*] = 324.377[3]). PCA revealed the presence of one component with eigen values exceeding 1, explaining 65.319 % of the variance. For feasibility, the Kaiser–Meyer–Olkin value was.705 and Bartlett's Test of Sphericity (Bartlett, 1954) also reached statistical significance (χ^2 [*df*] = 554.044 [3]). One component was identified with eigen values exceeding 1, explaining 73.724 % of the variance. Next, CFA for the three variables was conducted using IBM AMOS version 28 for factor validity. Model fit was satisfactory (χ^2 (24) = 80.975, $p < .001$, CFI = .968, RMSEA = .068, SRMR= .0433).

4. Results

4.1. Hypotheses testing

Kline's (1998) two-step process was used for data analysis. The measurement model with disengagement achieved good fit (χ^2 (48) = 145.309, $p < .001$, CFI = .965, RMSEA = .063, SRMR= .0475). The measurement model with information seeking also had a good model fit for desirability beliefs (χ^2 (48) = 156.730, $p < .001$, CFI = .963, RMSEA = .067, SRMR= .0489). The measurement model with information forwarding also achieved a good model fit (χ^2 (59) = 180.932, $p < .001$, CFI = .962, RMSEA = .064, SRMR= .0517). In testing three different structural equation models, bootstrapping was performed (number of bootstrap samples = 2000, bias-correlated confidence level = 90). The paths were then analyzed to test the hypotheses.

The first structural model (see Fig. 1) predicting disengagement was found to have good fit (χ^2 (48) = 145.309, $p < .001$; CFI = .965, RMSEA = .063, SRMR= .0475). The first SEM model results show that when publics perceived food waste as a distant issue, they did not consider reducing food waste desirable (H1) ($\beta = -.210$, $p < .001$) nor feasible (H2) ($\beta = -.289$, $p < .001$). Publics' perception of distance from food waste also led to disengagement (H3) ($\beta = .697$, $p < .001$). Meanwhile, desirability (H4) and feasibility (H5) had no impact on disengagement (Fig. 1).

The second structural model (see Fig. 2) predicting information seeking had good model fit (χ^2 (48) = 156.730, $p < .001$; CFI = .963, RMSEA = .067, SRMR= .0489). Similar patterns were found for the relationships between psychological distance and desirability (H1) ($\beta = -.200$, $p < .001$), and between psychological distance and feasibility (H2) ($\beta = -.285$, $p < .001$). The SEM model's results show that when publics perceived food waste as a distant issue, they still sought information about it (H6) ($\beta = .124$, $p < .05$). Interestingly, desirability and feasibility had different effects on information seeking. When publics see addressing food waste as desirable, they are willing to engage in information seeking behavior to learn more about the issue (H8) ($\beta = .833$, $p < .001$). However, when they see acting on food waste as feasible (H8) ($\beta = -.413$, $p < .001$), they are no longer interested in seeking information about the issue (H10) (see Fig. 2).

The third structural model (see Fig. 3) predicting information seeking also had good model fit (χ^2 (59) = 180.932, $p < .001$; CFI = .962, RMSEA = .064, SRMR= .0517). The results shared similar patterns: when publics perceive food waste as a distant issue, they still forwarded information to others (H7) ($\beta = .108$, $p < .05$). Publics did not consider reducing food waste desirable ($\beta = -198$, $p < .001$) (H1) or feasible ($\beta = -285$, $p < .001$) (H2) when they considered the issue to be distant. When publics saw acting on food waste as desirable, they engaged in information forwarding behavior (H9) ($\beta = .939$, $p < .001$). However, when they saw addressing the issue as feasible ($\beta = -396$, $p < .001$), they would not engage in information forwarding any more (H11) (see Fig. 3).

5. Discussion

Environmental communicators or campaigners often face the challenge of having to frame abstract and distant subjects into concrete and urgent messages to persuade target audiences to engage in certain desired actions (McIlroy-Young & Thistlethwaite, 2019). While this is critical to increase public engagement to enhance pro-environmental behavior, individuals' psychological distance remains a major barrier due to the distant and uncertain nature of environmental issues such as climate change (McIlroy-Young & Thistlethwaite, 2019). Another challenge is that individuals' attitudes and behaviors are not necessarily consistent, especially when future time perspectives and future-oriented behaviors are introduced (Rabinovich et al., 2010). Long-term and short-term time perspectives can produce different effects on individuals' attitude–behavior consistency. Our study finds that psychological distance is a significant factor contributing to publics' disengagement from pro-environmental behaviors.

This study was conducted in response to calls for additional research on approaches to assessing and enhancing the influence of psychological distance (and related constructs) on individuals' engagement with environmental issues (K. Kim, 2023). It adopts CLT as a theoretical

[1] The authors initially ran SEM with the three dependent variables (i.e., disengagement, information seeking, and information forwarding) in one model. However, the model-data fit was not satisfactory for the results to be interpreted. Poor SEM fit could be caused by overlaps among the three dependent variables, noting that no research to date has identified significant associations among the three dependent variables. Current research on CLT has also examined different dependent variables separately depending on the contexts of the studies (K. Kim, 2023). Thus, it is theoretically appropriate for disengagement, information seeking, and information forwarding to be tested as dependent variables in three separate models.

Table 5
Bicorrelations.

	Psychological distance	Desirability	Feasibility	Information seeking	Information forwarding	Disengagement
Psychological distance	1					
Desirability	−.144 * *	1				
Feasibility	−.245 * *	.590 * *	1			
Information seeking	.076	.409 * *	.151 * *	1		
Information forwarding	−.130 * *	.504 * *	.389 * *	.594 * *	1	
Disengagement	.603 *	−.080	−.172 * *	.187 * *	−.122 * *	1

* * Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

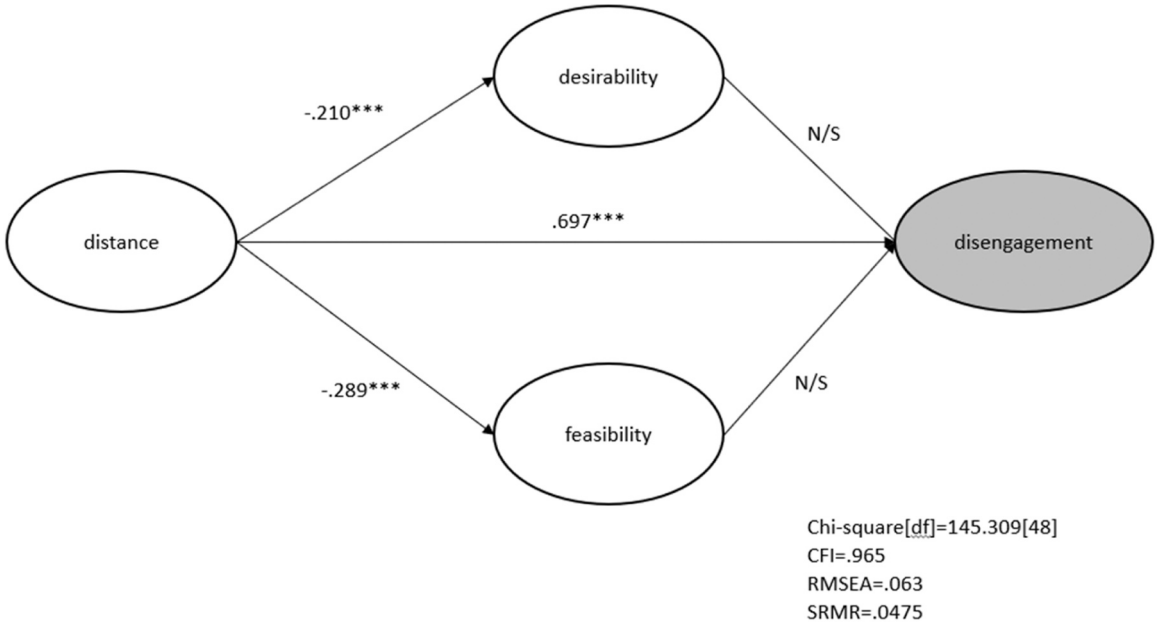

Fig. 1. Model with disengagement as an outcome variable.

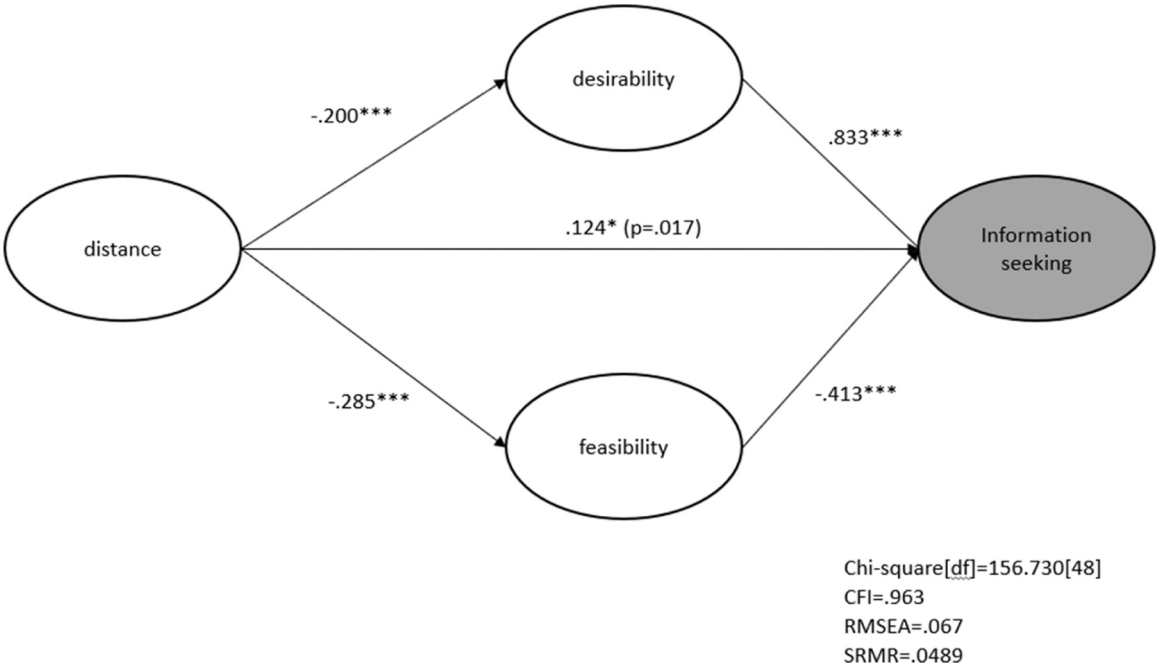

Fig. 2. Model with information seeking as an outcome variable.

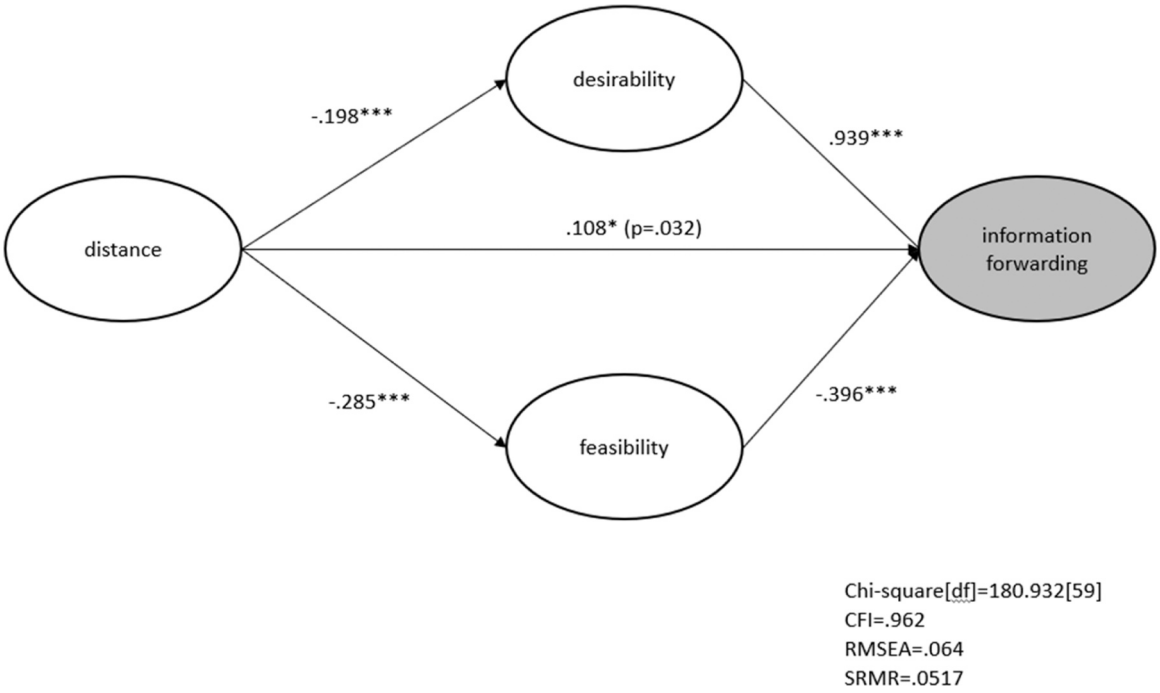

Fig. 3. Model with information forwarding as an outcome variable.

framework to examine the dynamics of psychological distance, desirability, and feasibility on disengagement, information seeking and information forwarding. Of note are some unexpected findings. First, desirability and feasibility had no impact on disengagement. This reflects the significance of psychological distance alone in triggering cognitive, emotional, and behavioral disengagement. This could be caused by the context of the issue being tested in this study. Second, the effect of feasibility on information seeking was negative rather than positive as hypothesized. Likewise, the effect of feasibility on information forwarding was also negative, contrary to the hypothesis. This may reflect that if people consider the issue of food waste to be feasible, actionable, and attainable, they no longer feel the need for further information regarding the issue. They also no longer feel the need to forward information about the issue to others, possibly because they think others may also find it feasible, actionable, and attainable. As food waste is already part of everyone's daily life, evaluating feasibility of reducing food waste may not be seen to be as critical as the matter of how distant or proximal the food waste issue is. Turner (2017) suggested that because people prioritize the health of their family, they throw away leftovers. This implies that health concerns are more urgent and immediate than environmental sustainability concerns. In addition, because environmental sustainability is a future-oriented issue, it is possible for people to weigh their self-interest (e.g., price, convenience, immediate outcome, short distance) over social interest (e.g., protecting the environment) (Kilian & Mann, 2020). In turn, this helps people justify that addressing such a distant issue does not require their immediate action.

This unexpected finding points to further research on how feasibility beliefs can, in fact, discourage certain information behaviors related to an issue. This also signals a need for further research on antecedents to, or factors contributing to, individuals' psychological distance to better understand their disengagement in environmental sustainability issues. As such, research that promotes framing distant issues with concrete suggestions for short-term goals and behaviors may need to be revisited (K. Kim, 2023; McIlroy-Young & Thistlethwaite, 2019). For example, existing approaches to food waste reduction, such as Australia's Love Food Hate Waste campaign, have encouraged people to waste less food to save money and the environment. The campaign may provide some tangible ideas, such as how to plan meals or make use of leftover food. However, even if tangible ideas are given, there might be other causes of disengagement with the issue of food waste (Kilian & Mann, 2020). It might be worth investigating the meanings of psychological distance in more depth to better operationalize it. For example, Kundrát and Rojková's (2021) qualitative study suggested several subcategories of psychological distance, including degree of fondness, association with fun or boredom, perceived degree of meaning or significance, amount of information available, degree of abstractness or concreteness of the mental representation, perceived utility, frequency of activity, perceived degree of ease or difficulty and degree of effort. Whenever CLT is applied to a specific context, various subcategories of psychological distance may be identified.

This study has focused on individuals' disengagement, information seeking, and information forwarding rather than their pro-environmental attitudes and behaviors as outcome variables. It argues that psychological distance affects individuals' information behaviors as they seek to reduce psychological distance on issues that are problematic (Brügger et al., 2016). Even though the findings portrayed the significance of psychological distance on the three outcome variables, the significance varied when desirability and feasibility were added into the mix. Although information behaviors do not always result in behaviors or behavioral intentions (Yoo et al., 2018), information behaviors are a critical step to problem solving (J.-N. Kim & Grunig, 2011) that could result in communicative interactions that dictate the social norms in terms of what pro-environmental behaviors are considered desirable and feasible for distant issues (J.-N. Kim & Grunig, 2021; Lu et al., 2013; Ryoo et al., 2017). As Signitzer and Prexl (2008) noted, organizations face communication challenges in their sustainability communication due to the complexity of sustainability issues and also due to different stakeholder interests. To communicate sustainability issues to diverse stakeholders more effectively, public relations professionals or communication managers start their communication strategy development from differentiated target group analysis, segmentation, and knowledge of stakeholders (Signitzer & Prexl, 2008). Our study points to the importance of acquiring such stakeholder and public insights to facilitate better engagement in sustainability-related issues.

This article responds to Canel's (2023) call for public relations

research that addresses the United Nations 2030 Agenda for Sustainable Development by taking an interdisciplinary approach. She noted, "To the extent that the 2030 Agenda will be possible if partnering with different stakeholders, theorizing about public relations would move from a predominant managerial perspective to stress the focus on the public" (p.6). This research applies a theory from psychology (i.e., construal level theory) and adds additional knowledge of publics' disengagement and information behaviors to the public relations literature in the context of sustainability issues. For public relations and sustainability communication, our findings point to the factors that contribute to publics' disengagement and information behavior respectively. Communicators or campaigners need to identify the causes of psychological distance as well as the ways to reduce psychological distance to mitigate publics' disengagement. Meanwhile, communicators could use the desirability as a frame in designing their communication messages to encourage publics' information seeking and information forwarding behavior about a sustainability issue.

In addition, by responding to Jelen-Sanchez's (2017) criticism that the topic of engagement has been studied mostly from a management/functional perspective while adoption of critical, sociocultural, cocreational and psychological perspectives is still lacking, this research attempts to provide alternative perspectives for investigating publics' disengagement in the context of environmental sustainability. As Jelen-Sanchez (2017) noted, engagement research focusing on publics or on both organizations and publics, is growing. This research has provided more in-depth explanations on the dynamics of publics' disengagement and information behaviors.

6. Limitations and future research directions

Like all studies, this study has limitations. Its results are only generalizable to the Australian population. The identified patterns in this study may not reflect how citizens in other countries perceive and react to environmental issues. In addition, we specifically tested food waste as an environmental issue, and these results may not be applicable to other environmental issues. Although this study used quota sampling to reflect the general distribution of the Australian population by age and gender, the findings might be limited to Qualtrics' research panels. Pro-environmental behavior was not investigated in this research. Future scholarship may need to consider the effects of message-framing (e.g., feasibility and desirability beliefs) on individuals' information behaviors and pro-environmental behaviors. It may also be worth investigating how individuals prioritize diverse environmental issues, and how their perceived priorities affect their communication and behaviors. As many environmental issues are future-oriented to some extent, the role of future orientation (Corral-Verdugo & Pinheiro, 2006) may explain individuals' perceived desirability or their behavioral intention for such issues. Because this study has only examined temporal and spatial distance within psychological distance, future research may consider examining social and probabilistic distance as well (Trope & Liberman, 2010). As noted in the discussion, the operationalization of psychological distance for application to specific contexts could be improved. As the current study does not examine publics' engagement, it might be beneficial to juxtapose the roles of desirability and feasibility on disengagement and engagement in future research studies.

7. Conclusion

Sustainable development is one of the most pressing challenges we face globally. Moreira et al. (2022) called for a global approach to identify psychological mechanisms that "shape how individuals experience and relate to their external environments and influence sustainable behavior broadly over time" (p. 2). By examining a psychological theory (construal level theory, or CLT, of psychological distance) in relation to disengagement and information behaviors, this study has responded to that call. Canal (2023) invited public relations scholars and practitioners to consider the role of public relations research and practice in advancing the 2030 Agenda on sustainability. As she noted, the implementation of such global agreement requires variety of communication activities and collaboration among different actors. Prior to such practices before occurring, public relations' knowledge and expertise is required, such as building relationships, developing narratives, and creating and leveraging intangibles such as social capital and trust (Canal, 2023). This study has contributed to public relations literature by explaining factors that drive public disengagement and information behaviors. Without such insights, neither relationship building nor collaboration among different stakeholders would not happen. Therefore, explaining publics' disengagement in environmental sustainability issues contributes to the body of knowledge in public relations and sustainability communication, and to practice in corporate communication, where many professionals are now expected to develop and execute corporate communication and sustainability plans and to engage with stakeholders on environmental, social and governance initiatives. As such, approaches to reducing psychological distance to environmental sustainability issues should be further developed in public relations research and practice.

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Declaration of Competing Interest

none.

Appendix

The News Daily.
3 July 2022.
Effective management of environmental issues is fundamental to Australia's sustainability. According to Services Australia, food waste costs the Australian economy around $36.6 billion each year. Each year Australian households waste around 7.6 million tonnes of food – this wastage equals about 312 kg per person, equivalent to around one in every five bags of groceries or $2000 to $2500 per household per year.

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