Impact of Psychological Distance on public acceptance of waste-to-energy combustion projects

Qianqian Zhou[a,b], Xiaoyan Luo[c], Xin Gao[a], Bo Xia[d], Yongjian Ke[e], Martin Skitmore[f], Yong Liu[b*]

[a] School of Economics and Management, Tongji University, Shanghai 200092, China

[b] School of Civil Engineering and Architecture, Zhejiang Sci-Tech University, Hangzhou 310018, China

[c] School of Business Administration (MBA School), Zhejiang Gongshang University, Hangzhou 310018, China

[d] School of Architecture and Built Environment, Queensland University of Technology (QUT), Brisbane 4001, Australia

[e] School of Built Environment, University of Technology Sydney, Ultimo NSW 2007, Australia

[f] University Professorial Fellow, Faculty of Society and Design, Bond University, Robina 4226, Australia. mskitmor@bond.edu.au, https://orcid.org/0000-0001-7135-1201.

* Corresponding author. *E-mail address*: jhly1007@zstu.edu.cn (Y. Liu).

[1]Abstract:

Waste-to-energy (WTE) projects have attracted considerable attention due to their role in addressing waste management issues and promoting renewable energy production. However, while public acceptance of these projects remains controversial, psychological distance (PD) may be a key shaping factor in their construction. This study, grounded in the Construal Level Theory (CLT) and social

[1] WTE: Waste-to-energy; PD: Psychological distance; CLT: Construal Level Theory; NIMBY: Not in My Backyard.

distance theory of power, uses a behavioral investigation experiment to examine the role of PD in WTE facilities. The findings reveal that shorter PD is associated with higher public perception of risk and lower perception of economic benefits, fairness, and public acceptance. Additionally, a closer social distance of power tends to correspond with lower construal levels and a greater inclination to support the construction of WTE facilities, further supporting the CLT and social distance theory of power. The findings provide theoretical support and practical guidance for the sustainable development of WTE facilities, encouraging a sense of shared destiny and collaborative governance across society.

Keywords:

Waste-to-energy Combustion Project; Public Perception; Construal Level Theory; Social Distance; Power; NIMBY Syndrome

1 Introduction

Currently, waste-to-energy (WTE) projects are attracting considerable attention due to their role in addressing waste management issues and promote renewable energy production (Xu et al., 2023), but their public acceptance remains a complex and contentious issue (Zhou et al., 2022). WTE facilities, as one of the fundamental infrastructures in national economic and social development, possess such positive externalities as wealth creation and improvement of livelihoods (Xu & Lin, 2023), but also harbor potential negative externalities, including environmental pollution and health hazards (Zu et al., 2024). Due to the potential emission of toxic heavy metals, dioxins, and other pollutants during the operation of WTE facilities (Liu et al., 2021), as well as property depreciation and a decline in community image attributed to issues such as odors, noise, and increased traffic (Schively, 2007; Zhang & Lin, 2023), nearby residents are likely to become increasingly concerned about their physical and mental health, living environment, and economic well-being (Sun et al., 2023). Their unequal distribution has led to collective opposition from residents neighboring WTE facilities, thereby triggering group-based "Not in My Backyard" (NIMBY) conflicts, which has become a significant barrier to the sustainable development of WTE facilities (Liu et al., 2018a). The occurrence of numerous group-based NIMBY conflicts is severely impeding the long-term health and stability of society, as well as effective government planning and management (Liu et al., 2021; Xu et al., 2023). Therefore, understanding the factors influencing the public perception of WTE facilities is valuable for policymakers, urban planners, and project developers.

Previous studies indicate that public perception of NIMBY projects is influenced by various factors (Chung & Kim, 2009; Liu et al., 2021), of which distance to WTE facilities is considered the

most significant (Cong et al., 2021b). However, research findings on the impact of distance on public perception of NIMBY projects are inconsistent, suggesting either a negative correlation (Cong et al., 2021a; Xu et al., 2023), a positive correlation (Lima, 2004; Frantál et al., 2016), or a marginal zone effect, characterized by fluctuations in risk perception, initially decreasing and then increasing (Xie et al., 2011; Zhou et al., 2022). The diversity of distance-related phenomena has spurred studies into the underlying causes for the difference in physical distance laws, and analyzing social psychological factors for possible explanations. Studies of the psychological distance (PD) of the public from NIMBY facilities are gradually being initiated.

Currently, the prevailing approach in PD-related research relies on Construal Level Theory (CLT) as proposed by Trope and Liberman (2010), which encompasses four well-established PDs – temporal, spatial, social, and hypothetical distances – and has been extensively applied and validated (Tan et al., 2020). Drawing upon the CLT, for instance, Geng et al. (2018), Tan et al. (2020), and Shah et al. (2023) investigate the relationship and impact of public PD on perceived risks and attitudes towards NIMBY facilities, shale gas development, and carbon capture and storage, respectively. However, the current CLT lacks consideration of power elements. Of note, despite the lack of direct evidence indicating that power is a component of the PD, some studies attempt to further enrich the CLT by considering power as a novel dimension of PD (e.g., Zhong et al., 2013; Geng et al., 2018).

On the other hand, current studies of the distance differences of NIMBY facilities tend to focus predominantly on the impact of physical proximity – i.e., physical, geographical, or spatial distance differences – on public acceptance. However, while these yield fruitful outcomes, the study of the effect of PD differences on public perceptions remains relatively underexplored (e.g., Cong et al., 2021a; Zhou et al., 2022; Xu et al., 2023), especially towards NIMBY facilities. Meanwhile, existing

PD-related research in the NIMBY domain has primarily focused on explaining the possible reasons for attitude and risk differences using social psychological factors, without explicitly proposing the concept or conducting targeted, specialized research on PD (e.g., Carlisle et al., 2015; Zhou et al., 2022). Furthermore, public perception is the result of multiple coupling factors, and extant research findings tend to focus predominantly on such perception-related studies as risk perception and public acceptance (e.g., Bian et al., 2021; Sun et al., 2023), while perceptions regarding economic benefits and fairness receive relatively less attention.

Exploring how PD affects public awareness and acceptance of WTE facilities will provide an important contribution to the literature and address the aforementioned gap. In response, therefore, based on the CLT and the social distance theory of power, the present study conducts a behavioral investigation experiment through campus recruitment, collecting data on public perception, construal level, and behavioral intention toward WTE facilities from diverse demographic groups, followed by a descriptive statistical analysis, factor analysis, and one-way ANOVA to examine the influence of PD. By elucidating the underlying mechanisms involved, policymakers and project operators can devise more targeted communication strategies and engagement approaches to attract greater community support in advancing the implementation of sustainable WTE initiatives.

2 Theoretical framework and research hypotheses

2.1 Public perception

Public perception, whose origin can be traced back to the progressive relationship between emotion, behavior, and cognition within the framework of attitude theory models, refers to the subjective evaluation of specific events, issues, technologies, or policies (Qu & Lu, 2016; Schleich

& Faure, 2017; Cong et al., 2021a; Shen et al., 2023). It involves the public's emotional processing of cognitive information and its subsequent transformation into behavioral intentions (Qu & Lu, 2016), which are closely related to public attitudes toward participating in public affairs. The essence of studying public perception of WTE facilities lies in exploring the societal acceptance of infrastructure characterized by NIMBY effects, wherein communal benefits are widespread while localized residents shoulder the burdens, ultimately aiming to promote urban sustainability (Schively, 2007).

In the field of NIMBY, the analytical framework of public acceptance towards nuclear energy highlights that psychosocial factors and perceptions (e.g., public trust, perceived risk, perceived benefits, and fairness) (e.g., Slovic, 1987; Visschers and Siegrist, 2012; Liu et al., 2021) are crucial determinants of public acceptance of nuclear energy. Previous studies indicate that when the public is confronted with unknown, uncontrollable, and potentially catastrophic risk factors, they often exhibit significant fear, which may lead to negative attitudes and behaviors (Slovic et al., 1991; Ge et al., 2020). Meanwhile, the economic and social benefits promised by the government and operators are regarded as key factors influencing local residents' attitudes toward NIMBY facilities (Chung and Kim, 2009; Wang et al., 2019), while the perceived potential economic benefits significantly affect their acceptance of new technologies (Liu et al., 2019). Despite the diverse motivations behind attitudes of support or opposition to specific NIMBY facilities, a key factor frequently highlighted in existing research is social justice or fairness (Liu et al., 2021; Zhang & Lin, 2023). The imbalance between the social benefits of WTE facilities and the personal losses experienced by local residents can evoke feelings of unfairness and deprivation, subsequently triggering aversion (Li & Zou, 2021; Huijts et al., 2022). Additionally, public acceptance, a crucial indicator for the success of NIMBY

facility siting and construction (Achillas et al., 2011; Liu et al., 2018a), refers to the degree to which the public embraces new technologies or methods, and is widely applied in studies of public attitudes and behaviors, including NIMBY siting, decision-making, and technological innovation (Liu et al., 2021).

Accordingly, this study conceptualizes public perception concerning WTE facilities as the subjective evaluation by the public, considering such factors as perceived risk, economic benefits, fairness, and public acceptance, in the context of infrastructure typified by NIMBY effects and practical operability (Chung & Kim, 2009; Liu et al., 2018a; Woo et al., 2021).

2.2 Psychological distance and Construal Level Theory

Trope and Liberman (1998) introduced the concept of PD based on the subjective perception perspective into social psychology, linking it with Temporal Construal Theory. As investigations progressed, the conceptualization of PD has transcended its initial focus on temporal aspects, encompassing a spectrum of other dimensions of distance, which ultimately led to the formulation of the current CLT (e.g., Liberman & Trope, 2008; 2014; Trope & Liberman, 2010; 2011). Accordingly, from the perspective of CLT, PD refers to an individual's perception of the distance between themselves and specific objects or events in terms of temporal, spatial, social, and hypothetical dimensions, depending on different reference points (Liberman & Trope, 2008; Trope & Liberman, 2010). Social distance, in particular, pertains to the perceived distance or intimacy between oneself and specific entities (e.g., self vs. others, friends vs. strangers, in-group vs. out-group), with the remaining dimensions of PD sharing similar definitions (Liberman & Trope, 2014). The emergence of CLT has further contributed to the maturation of PD.

As a cognition-centric theory, CLT delineates how individuals encode and retrieve information, reflecting the abstract mental representations (Wiesenfeld et al., 2017). Depending on the level of abstraction, construal level can be categorized into high-level construal (e.g., abstract, simplified, superordinate, or goal-relevant mental representations) and low-level construal (e.g., concrete, complex, subordinate, or goal-irrelevant mental representations) (Trope & Liberman, 2010; Lee, 2019; Wang et al., 2021). PD is a measure of distance within CLT, which posits that PD will systematically influence individuals' mental representations of the surrounding world. When individuals perceive greater PD from a specific object, its details and contextual features become blurred and uncertain, while its primary and stable characteristics become more salient and significant, leading individuals to adopt abstract mental representations within CLT (Trope & Liberman, 1998; Soderberg et al., 2015). However, not only does PD influence construal level, but construal level also affects individuals' perception of PD from specific objects; thus, forming a paired interactive mechanism between distant PD and high-level construal and close PD and low-level construal (Huang et al., 2015; Trope & Liberman, 2011).

2.3 Social distance theory of power

Power is a foundational concept in social science research, with the most widely used definition in social psychology referring to asymmetric control over valuable resources (Magee, 2020). Psychologists underwent a shift from viewing power as a structural variable grounded in social realities to conceptualizing it as a personal psychological attribute (Overbeck & Park, 2001; Chen et al., 2001), serving as both a structural variable and a cognitive construct based on psychological attributes (Galinsky et al., 2003). This means the suggestion or recall of power-related experiences,

whether conscious or unconscious, can activate the concept of power and associated behavioral tendencies, regardless of individuals' actual power or social positions, thereby broadening the applicability of the power concept beyond social structures (Galinsky et al., 2003; Boait et al., 2006).

Magee and Smith (2013) integrate the effects of power and CLT, proposing the social distance theory of power and summarizing its model, asserting that the asymmetric interdependence of individuals results in asymmetric experiences of social distance, with high-power individuals endowed with more resources, capable of operating autonomously, thereby perceiving greater social distance compared to low-power individuals. The hierarchical structure of society forms a pyramid-like configuration wherein individuals with power are psychologically distanced from the perceived social distance (Lammers et al., 2012). Accordingly, by CLT, heightened social distance signifies a more abstract construal level, indicating a propensity for high-power individuals to adopt abstract mental representations (Trope & Liberman, 2000; Magee & Smith, 2013). Power can manipulate a fundamental dimension of mental representations through construal level, potentially leading to significant impacts on attitudes, behaviors, and cognition (Magee & Smith, 2013).

2.4 Theoretical framework

The current study endeavors to integrate the CLT and the social distance theory of power to research the influence of distance on public perception of WTE facilities from a psychological perspective. The role played by social distance is critical when examining NIMBY conflict issues as it reflects individuals' cognitive proximity to specific phenomena and directly influences their attitudes, behaviors, and perceptions. Specifically, the CLT suggests that greater social distance leads to more abstract mental representations, whereas lesser social distance tends to result in concrete

representations. Meanwhile, considering the asymmetric power dynamics between the two core stakeholders—decision-makers and the public—decision-makers often resort to intentionally avoiding or suppressing public attitudes during the planning and decision-making processes for WTE facilities, a disparity that may significantly influence the successful implementation of such facilities (Liu et al., 2019; Zu et al., 2024). The social distance theory of power emphasizes the influence of varying power statuses on the perception of social distance. Furthermore, as a quintessential example of NIMBY facilities, public perceptions of risks, economic benefits, fairness, and acceptance of WTE facilities are often influenced by both social distance and power dynamics. Both theories emphasize the elements of construal level and involve behavioral intention, positing that psychological distance influences these elements. Additionally, the important research parameter in this study—public perception—is defined as the process through which the public emotionally processes cognitive information and subsequently transforms it into behavioral intentions. Accordingly, following the research concepts and theoretical underpinnings of these two theories and the literature review above, the theoretical framework of the study is established (see **Fig. 1**).

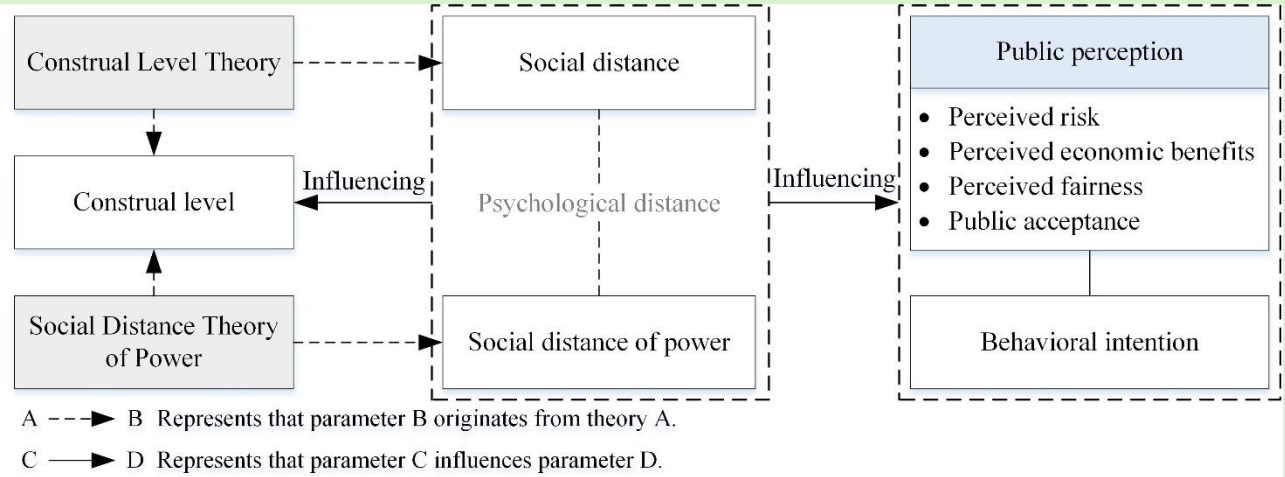

Fig. 1. Theoretical framework

2.5 Research hypothesis

(1) Social distance, public perception, construal level, and behavioral intention

Building upon studies on PD and risk perception related to potential risk energy facilities (e.g., Frantál et al., 2016; Geng et al., 2018; Shah et al., 2023) and integrating the concept of CLT within the framework of research into WTE facilities, social distance can be used to depict the extent of familiarity, relevance, or impact individuals or groups have on WTE facilities. More precisely, the extent of involvement in the establishment and operation of WTE facilities, such as participation in decision-making processes or employment arrangements (e.g. Zheng et al., 2015; Geng et al., 2018), along with the community and cultural ties of local residents residing or working near these facilities (e.g. Frantál et al., 2016; Tsai et al., 2021), as well as the connections between non-local residents and the facilities such as familial bonds (e.g. Sun et al., 2017; Giordano et al., 2020), serve as relational links that diminish the social distance towards WTE facilities.

As a critical construct within PD, social distance can impact public perception of potential risk events or facilities. Prior studies have indicated that social distance plays a role in diminishing public perception of health and environmental risks (e.g., Carmi & Kimhi, 2015; Aslam & Rana, 2022). For example, Kasperson et al. (1988) suggest that the psychological states of the public in different regions may have a "ripple effect," whereby there is a negative correlation between PD (e.g., social distance) and risk perception; Lewonstein (2005) posits that individuals are inclined to perceive environmental threats as more severe when they possess personal familiarity with the extent of harm associated with them; Carmi and Kimhi (2015) highlighted that individual experiences contribute to a reduced risk assessment of the potentially severe consequences of global warming; additionally,

studies such as Soni (2018) and Huang et al. (2018) have observed that greater social distance diminishes people's perception of the significant health risks associated with nuclear power. Perceptions of economic benefit and fairness are similarly closely associated with social distance. Shang (2018) posits that the public acceptance of disaster risks is primarily influenced by interests and social distance, with greater perceived social distance associated with higher acceptability of disaster risks, highlighting social distance as an important determinant in this dynamic. Using a dictator game, Wu et al. (2011) use an experimental research approach to explore how individuals responded to equitable or inequitable allocations from either acquaintances or unfamiliar individuals and find that the social proximity between the distributor and the recipient notably shaped recipients' perceptions of fairness. Yang and McAllister (2020) indicate that, when the perceived distance between risk events and the public diminishes, individuals subjectively amplify the risks associated with the facilities. While such facilities as nuclear power plants, substations, and WTE facilities generate such positive externalities as wealth creation and improved livelihoods, they also entail negative consequences, including the uneven distribution of costs and benefits for local residents and potential environmental pollution, which encourages public opposition (Liu et al., 2021; Zhou et al., 2022).

Meanwhile, local residents are more prone to experiencing a sense of deprivation and unfairness compared to non-local residents, thereby triggering NIMBY conflicts (Edelstein, 2004). Consequently, when the public perceives a closer relationship with the facility, it may evoke feelings of unfairness and deprivation, influencing their perceptions of fairness and economic interest. Boudet et al. (2014) indicate that the public, particularly those more familiar with energy facilities, are less inclined to accept such facilities. Simultaneously, reducing social distance also facilitates individuals'

awareness of belonging to the same group as others, thereby enhancing trust in others (Glaeser et al., 2000). Cui et al. (2020) stress that social distance and communication significantly influence consumer trust, consequently impacting behavioral intentions. Liu et al. (2022) show that the public perception of risk prompts a psychological response geared towards risk mitigation, consequently shaping behavioral intention based on subjective assessments. Furthermore, consistent with the principles of CLT, individuals tend to use abstract cognitive representations when they perceive a greater social distance from specific objects (Liberman & Trope, 1998; 2008).

Therefore, based on the arguments above, the following hypotheses are proposed:

H1*:* Social distance negatively affects perceived risk (*H1a*) and positively affects perceived economic benefits (*H1b*), fairness (*H1c*), and public acceptance (*H1d*).

H2*:* The farther the social distance, the more inclined individuals are toward high-level construal.

H3*:* The farther the social distance, the more inclined individuals are toward positive behavioral intention.

(2) Social distance of power, public perception, construal level, and behavioral intention

Social distance theory of power stresses that individuals with higher authority tend to perceive a greater social distance than those with lower authority (Magee & Smith, 2013). A fundamental principle of this theory is that an increase in power results in the widening of social distance, prompting individuals to rely on higher-order and more abstract psychological representations (i.e., high-level construal) when interpreting situations relevant to their goals (Magee & Smith, 2013). According to Yao et al. (2020) and Li et al. (2020), power empathy improves empathetic accuracy,

with individuals perceiving higher power demonstrating a greater propensity for pro-social behaviors and considerations for others' well-being, which is particularly evident in contexts prioritizing social welfare goals. Conversely, those with lower power tend to focus more on specific concerns such as potential health/environmental risks, economic losses, and feelings of unfairness. Geng et al. (2018) revealed that, compared to groups with higher social distance of power, those with lower social distance of power are more inclined to oppose nuclear power construction and maintain negative attitudes. In previous studies, it has been demonstrated that higher power individuals or groups tend to have a preference for positive information related to specific objects and are optimistic concerning risks (Mourali & Nagpal, 2013; Li et al., 2020).

Consequently, these individuals or groups are more inclined to adopt positive coping strategies. In other words, in light of their heightened sense of responsibility, individuals or groups with a strong sense of power are more inclined to make decisions based on collective interests rather than the feelings and needs of individual others (Lammers et al., 2008; Magee & Smith, 2013). Building upon the literature concerning PD, a reasonable conjecture can be proposed that the social distance of power, considered a unique PD, parallels other dimensions of PD in CLT.

Therefore, based on the arguments above, the following additional hypotheses are proposed:

H4*:* Social distance of power negatively affects perceived risk (*H4a*) and positively affects perceived economic benefits (*H4b*), fairness (*H4c*), and public acceptance (*H4d*).

H5*:* The farther the social distance of power, the more inclined individuals are toward high-level construal.

H6*:* The farther the social distance of power, the more inclined individuals are toward positive behavioral intention.

Based on the aforementioned discussion and theoretical framework, the theoretical foundation of the research hypotheses is outlined in **Fig. 2**.

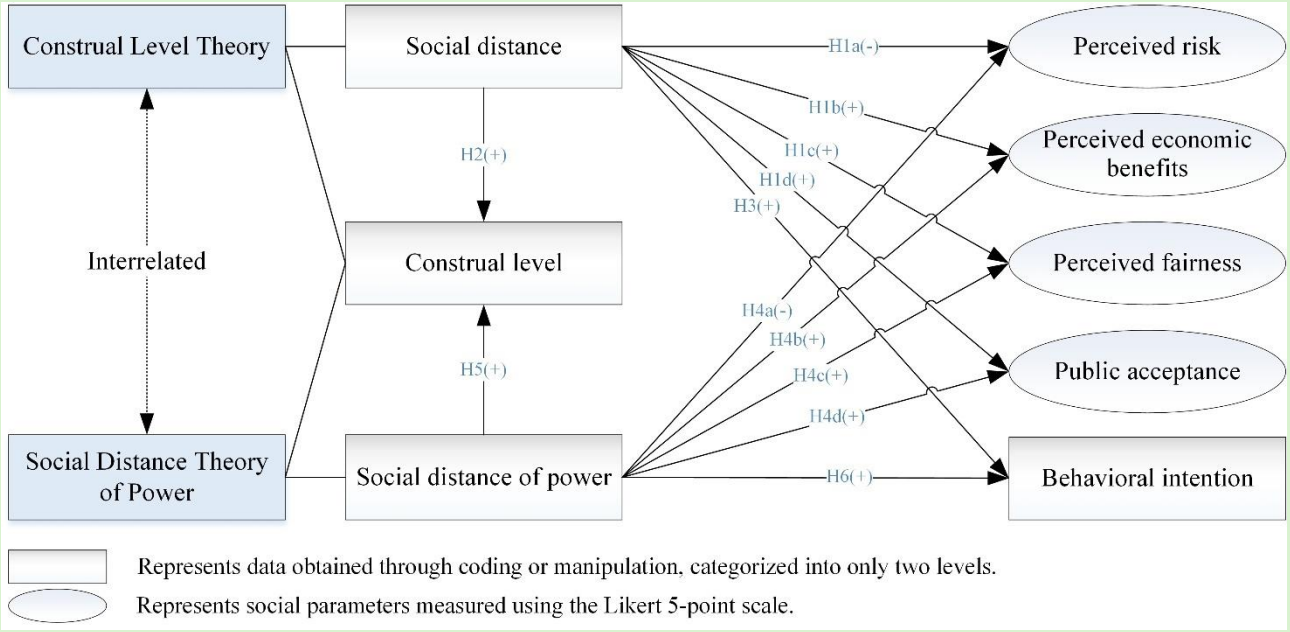

Fig. 2. Theoretical foundation of the research hypothesis

3 Research design

Traditional hypothesis testing is adopted here to empirically demonstrate the impact of PD on public perception of WTE combustion projects utilizing a combination of literature analysis, behavioral investigation experiment, and one-way ANOVA. The overall research framework, outlined in **Fig. 3**, consists of six primary steps. First, building upon theories of CLT and social distance theory of power, hypotheses are formulated regarding the associations between PD and public perception, construal level, and behavioral intention. Second, experimental protocols are established. Third, experimental materials are developed, encompassing both textual content and video production. Then, the efficacy of experimental manipulation materials is validated through preliminary testing. Subsequently, further refinement of the experimental design and optimization of

the manipulation material was carried out. Finally, a behavioral investigation experiment was conducted and recruited through campus channels to assess public perceptions of WTE combustion projects.

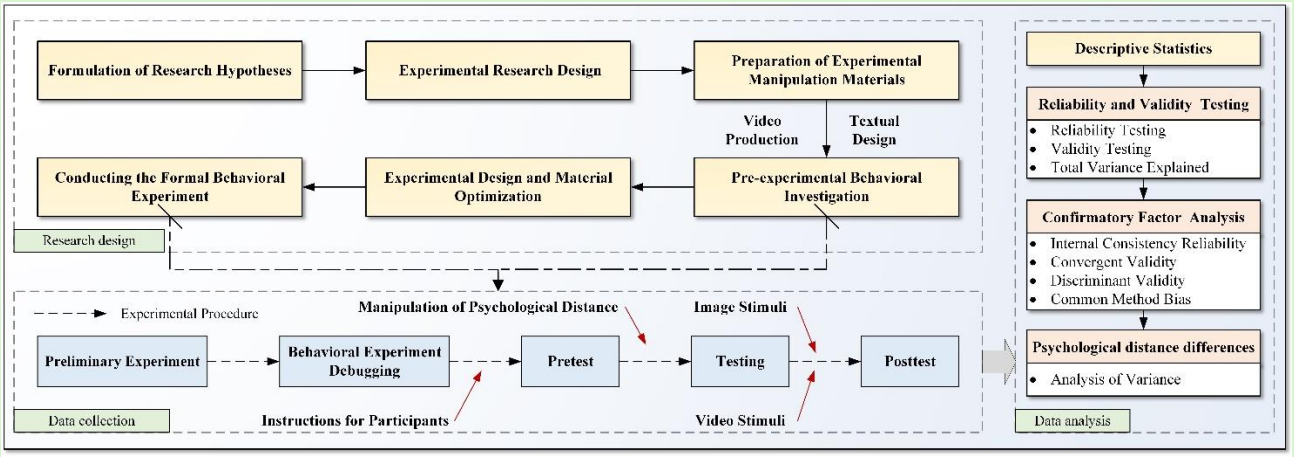

Fig. 3. Overall research framework

3.1 Materials

A between-subjects design was used to conduct a behavioral investigation experiment. The explanatory variable "distance" includes both social distance and social distance of power, while the response variables encompass construal level, behavioral intention, and public perception of the WTE facility. In line with the social distance theory of power that individuals with higher power tend to have greater social distance from those with lower power, and considering the significance of both government officials and the general public as key stakeholders in environmental governance (Chen et al., 2019), the experimental groups are classified into a high-power group ("government official") and a low-power group ("ordinary citizen"). Additionally, considering the varying social distances between participants and the WTE facility, the group of "ordinary citizens" was subdivided into two experimental groups: the 'general public' and the 'local public.'

The specific meaning of the assumed roles in the experimental group: 1) the "local public" group is instructed to imagine themselves as an ordinary citizen residing long-term in the Qiantang District of Hangzhou, with their current residence located within 3 kilometers of the proposed WTE facility; 2) the "general public" group are instructed to imagine themselves as an ordinary citizen residing long-term in the West Lake District of Hangzhou; 3) the "government officials" group are instructed to imagine themselves as a government official responsible for the site selection decision and construction of the large-scale WTE combustion project.

During the research process, participants engage with textual materials (including images) and relevant video demonstrations to enhance their understanding of WTE facilities. The textual materials depict the current state of waste management in China, emphasizing the challenges posed by the increasing volume of waste and elaborating on the purposes, advantages, and potential risks of WTE combustion. The image materials depict the process flow of WTE facilities through vivid illustrative diagrams. Additionally, video demonstrations complement the textual materials, objectively presenting the process, current status, development, and pros and cons of WTE combustion, which includes descriptions of two typical facilities: Hangzhou Tianziling Solid Waste Landfill and Phase II of the Shanghai Laogang Renewable Energy Utilization Center. Through visual imagery and accompanying narration, participants should gain a deeper insight into the process of waste combustion for energy generation. The research team collected all experimental manipulation materials, including text, images, and videos, through the academic literature, online resources, and news reports, and were subsequently utilized for drafting, designing, and production.

Public perception of WTE facilities was assessed using a scale designed following a comprehensive literature review (Thibaut et al., 1975; Colquitt et al., 2001; Chung et al., 2009; Ross

et al., 2014; Liu et al., 2018a; Liu et al., 2020), which comprised a 21-item self-administered questionnaire (see Supplementary Materials A). Specifically, the questionnaire examined four constructs, namely: (1) participants' perceived risk, (2) participants' perceived economic benefits, (3) participants' perceived fairness, and (4) participants' acceptance of the construction and operation of the WTE combustion projects. The measurement scales for the public perception were constructed using a 5-point Likert scale, prompting participants to express their degree of agreement with statements, ranging from 1 (strongly disagree) to 5 (strongly agree). Additionally, following the operational paradigm of PD and CLT, and drawing upon the operational methodologies proposed by Magee and Smith (2013) and Geng et al. (2018), behavioral intentions are operationalized by categorizing them into reasons for approval and disapproval.

3.2 Experimental procedure

Identical experimental procedures and materials are used to control for the influence of experimental variables. Participants are randomly assigned to three experimental groups. Drawing from the experimental operation regarding decision-maker roles (Geng et al., 2018), each group receive identical textual materials, differing only in the textual descriptions representing the roles. The participants are inserted at specific locations. This aims to evaluate the impact of social distance and social distance of power on experimental results through role portrayal. **Fig. 3** illustrates the experimental procedure.

Pre-test part. Before commencing testing, participants are required to complete an informed consent form indicating their voluntary participation in the experiment and are informed of any relevant non-experimental procedures and guidelines (e.g., anonymity, confidentiality, and strictly

academic purposes). During this phase, all voluntary behavioral investigation experiment participants have to complete the Public Perception Scale. This scale comprises only introductory instructions and measurement items. It is primarily used to assess the effectiveness of the experimental stimuli and the impact of other subjective factors on the outcomes. The completion time is 2-5 minutes.

Post-test part. After completing the pre-test and returning the measurement scale, participants receive the formal testing materials from the assistant examiner. They are required to carefully read the instructions for the formal test and provide their socio-demographic characteristics. The post-test is divided into four main steps: free association task, behavioral intention survey, experimental stimulus, and public perception evaluation. Specifically, participants are initially instructed to engage in a free association task, dedicating 5 minutes to reflect on the ongoing construction of WTE facilities in China and the associated latent risks to humans, guided by provided instructions and materials. Second, participants are asked to contemplate the potential advantages and disadvantages of constructing a large-scale WTE combustion project in the Qiantang District of Hangzhou within 3 minutes and write down three favorable/opposed opinions or any combination thereof (e.g., two favorable, one opposed; one favorable, two opposed). Subsequently, participants are required to conduct two brief assessments: 1) they are tasked with evaluating the ease of opinion retrieval from the preceding section, ranging from 1 (strongly difficult) to 5 (strongly easy); and 2) they are to assess the difficulty of further extracting additional favorable or opposing opinions from their minds, also ranging from 1 to 5. Finally, following the video and image presentation (a flowchart of the WTE combustion process) stimuli, participants have to complete a questionnaire assessing public perception.

A preliminary experiment was carried out in a pilot survey of 45 volunteers from Zhejiang Sci-Tech University to test the effectiveness of the textual and video manipulation materials used. Following the established experimental protocol, participants were given textual and video materials provided by the researchers and asked to answer relevant questions, with the majority expressing satisfaction with the substance of the materials provided and demonstrating apt comprehension and application thereof. The results of the one-way ANOVA, presented in **Table 1**, indicate that, while essentially no significant differences in public perceptions of different experimental groups were found during the pre-test, significant differences emerge after administration of the experimental stimuli, highlighting the effectiveness of the textual and video materials used.

Table 1 Distance difference analysis of dimensions in the preliminary experiment

Construct	Group	N	Mean		Std. dev		F		sig		Multiple comparisons	
			pre	post	pre	post	pre	post	pre	post	pre	post
Perceived Risk	1	18	2.963	2.787	0.760	0.553	0.649	8.053	0.527	0.001	/	1>3, 2>3
	2	15	2.833	2.022	0.639	0.483						
	3	17	3.098	2.726	0.543	0.553						
Perceived Economic Benefits	1	18	3.911	3.944	0.537	0.650	2.296	3.250	0.112	0.048	/	1<2, 2>3
	2	15	3.453	3.400	0.568	0.586						
	3	17	3.741	3.624	0.720	0.612						
Perceived Fairness	1	18	3.944	4.103	0.665	0.663	3.664	3.659	0.033	0.033	1<2	1<2
	2	15	3.714	3.857	0.532	0.616						
	3	17	3.311	3.462	0.846	0.814						
Public Acceptance	1	18	3.056	3.370	0.794	0.969	0.534	4.707	0.590	0.014	/	1<3, 2<3
	2	15	2.978	4.178	0.695	0.641						
	3	17	2.804	3.510	0.698	0.698						

Note: in multiple comparisons: 1, 2 and 3 represent local public group, general public group, and government official group, respectively; ">" indicates that when the confidence interval is 95%, the difference between the data on both sides of the symbol is statistically significant – the value on the left is significantly greater than the right; "<" indicates that when the confidence interval is 95%, the difference between the data on both sides of the symbol is statistically significant – the value on the right is significantly greater than the left.

3.3 Data collection

A total of 124 volunteers, 63 of whom were men, were recruited from Zhejiang Sci-Tech University through an advertisement, with requirements including demonstrating a serious and responsible attitude, possessing good concentration, having rich associative and imaginative abilities, and not having participated in similar behavioral investigation experiments recently. Participants were instructed to abstain from consuming caffeine and alcohol for at least 24 hours before the experiment, with an average age of 22.85 years (SD=1.852). Each participant received a compensation of CNY 40 (1 USD =7.23 CNY in April 2024) after completing the experiment with both quality and quantity. **Table 2** shows the results of the analysis of socio-demographic differences of all participants. More specifically, 84.67% of the participants were from Science, Technology, Engineering, and Mathematics disciplines; 20.16% were aware of WTE facilities; 96.77% of the participants lacked long-term exposure to WTE facilities, and familial relationships influenced none. The one-way ANOVA analysis results indicate no significant differences in the demographic characteristics of the experimental groups. Hence, individual factors can be ruled out as impacting the experimental outcomes.

Table 2 Participants' socio-demographic differences

Profile	Group	N	Mean	Std. dev	F	sig
Age	1	40	23.13	1.884	2.373	0.098
	2	44	22.36	1.806		
	3	40	23.10	1.809		
Gender	1	40	1.50	0.506	0.033	0.967
	2	44	1.50	0.506		
	3	40	1.48	0.506		
Academic Discipline	1	40	1.85	0.362	0.009	0.991
	2	44	1.84	0.370		
	3	40	1.85	0.362		

Have you heard of WTE facilities?	1	40	1.27	0.452		
	2	44	1.16	0.370	0.996	0.372
	3	40	1.18	0.385		
Is there a WTE facility located in or near the area where you or your family currently reside or have resided in the past?	1	40	2.00	0.000		
	2	44	1.95	0.211	0.983	0.377
	3	40	1.95	0.221		
Have any of your family members or relatives worked at a WTE facility?	1	40	2.00	0.000		
	2	44	2.00	0.000	/	/
	3	40	2.00	0.000		

Additionally, two experts conducted independent coding of the free association materials. Abstract, vague, and indefinite descriptions were designated high construal levels, whereas specific and detailed descriptions were classified as low construal levels, in line with CLT. The inter-rater reliability between the two experts was 90.32%.

3.4 Data analysis

The data analysis process was divided into four steps. First, a descriptive statistical analysis method was used to quantitatively evaluate the participants' perceptions of WTE power plants. Subsequently, utilizing SPSS 26.0, the statistical data of the sample was subjected to reliability and validity tests using Cronbach's Alpha and Exploratory Factor Analysis (EFA), respectively, to ascertain the sufficient internal consistency and structural validity of the measurement scale. Then, utilizing AMOS 26.0, a Confirmatory Factor Analysis (CFA) was conducted on the acquired scale data from the experiment to assess whether the correspondence between the latent factors and the observed items aligns with the study's predictions. Finally, a one-way ANOVA was used to compare public perceptions, including perceived risk, perceived economic benefits, perceived fairness, public acceptance, as well as construal level and behavioral intention within the different PDs.

4 Results

4.1 Descriptive statistics

Table 3 shows the descriptive statistical results for all the variables. Perceived fairness had the highest overall mean (3.51-3.9), followed by perceived economic benefits (3.47-3.92), public acceptance (3.20-4.08), and perceived risk (2.26-2.90), indicating a positive inclination towards WTE power plants. Additionally, techniques, e.g., factor analysis and structural equation modeling, necessitate that the data follows a normal distribution, a characteristic that can be assessed using skewness and kurtosis coefficients (Phakiti, 2018). As depicted in **Table 3**, all variables have absolute skewness and kurtosis coefficients less than 1, indicating that the data collected in this experiment conforms to multivariate normality.

Table 3 Statistical results of the descriptive variables

Construct	Indicator	Std. Factor Load	Kurtosis	Skewness	Mean	Std. dev
Perceived Risk (α= 0.890)	Q1	0.829	-0.973	0.045	2.90	1.100
	Q2	0.826	-0.445	0.322	2.62	1.033
	Q3	0.671	-0.679	-0.194	2.85	0.969
	Q4	0.712	0.342	0.618	2.26	0.901
	Q5	0.754	-0.589	0.215	2.70	1.067
	Q6	0.745	0.130	0.560	2.29	0.961
Perceived Economic Benefit (α= 0.833)	Q7	0.660	0.319	-0.366	3.82	0.687
	Q8	0.762	0.024	-0.209	3.69	0.667
	Q9	0.718	0.216	-0.271	3.81	0.667
	Q10	0.688	-0.174	0.251	3.47	0.715
	Q11	0.709	0.369	-0.367	3.92	0.682
Perceived Fairness (α= 0.883)	Q12	0.622	0.256	-0.467	4.04	0.715
	Q13	0.547	-0.247	0.165	3.51	0.727
	Q14	0.799	-0.196	-0.208	3.94	0.702
	Q15	0.724	-0.572	-0.142	4.15	0.638
	Q16	0.778	-0.586	-0.184	4.31	0.587
	Q17	0.787	-0.624	0.029	3.79	0.757
	Q18	0.772	-0.470	-0.155	3.94	0.730

Public Acceptance (α= 0.863)	Q19	0.769	0.959	-0.680	4.08	0.771
	Q20	0.921	-0.054	-0.376	3.70	0.865
	Q21	0.790	0.372	-0.290	3.20	0.928

4.2 Reliability and validity

Based on the experimental data, a reliability analysis was carried out using Cronbach's Alpha, and a validity test was conducted using EFA. The results, shown in **Tables 3** and **4**, indicate that the Cronbach's Alpha coefficient exceeded 0.8 for each dimension, the KMO value fell within the range of 0.8 to 0.9, and the significance level of Bartlett's test of sphericity was less than 0.05, with the total variance explained being 65.082%. Therefore, the designed scale has good reliability and a well-qualified structural validity.

Table 4 Validities of the scales

Index	Latent variable			
	1	2	3	4
Total Variance Explained	33.680	49.605	60.001	65.082
KMO			0.868	
Bartlett' s test of sphericity	χ^2		1414.396	
	df		210	
	Sig.		0.000	

4.3 Confirmatory Factor Analysis

Internal consistency reliability and convergent validity. All latent variables demonstrate satisfactory convergent validity and internal consistency reliability (see **Tables 3** and **5**), as indicated by their average variance extracted (AVE) measurements exceeding 0.5, composite reliability (CR) measurements surpassing 0.8, and standardized factor loadings greater than 0.5, by guidelines

provided by Hair et al. (2020) and Lin and Cheung (2022).

Table 5 Convergent and discriminant validity

Construct	Mean	Std. dev	CR	AVE	Perceived Risk	Perceived Economic Benefits	Perceived Fairness	Public Acceptance
Perceived Risk	2.60	0.809	0.890	0.575	0.758			
Perceived Economic Benefits	3.74	0.529	0.834	0.502	-0.294**	0.708		
Perceived Fairness	3.95	0.531	0.884	0.524	-0.241*	0.469***	0.724	
Public Acceptance	3.66	0.758	0.868	0.688	-0.694***	0.455***	0.420***	0.829

Note: The diagonal entries represent the square root of AVE, while others represent the correlation coefficients between latent variables; ***indicates p<0.001, ** indicates p<0.01, and * indicates p<0.05.

Discriminant validity. Discriminant validity is confirmed when latent traits represented by one construct show minimal correlation or significant divergence from those represented by other constructs, typically assessed by comparing the square root of AVE with correlation coefficients, with a higher AVE square root indicating satisfactory discriminant validity (Hair, 2009). As shown in **Table 5**, the correlation coefficients between any two latent variables are lower than the square root of the AVE for each latent variable, indicating that the internal correlations among the latent variables are higher than the external correlations. Thus, discriminant validity is established for each latent variable.

Model fit and common method bias (CMB). **Table 6** shows data on the approximate fit indices of the CFA model, suggesting that the hypothesized model fits well with the experimental data. Specifically, the GFI value (0.837) is slightly below the ideal threshold of 0.90. In contrast, the RMSEA and SRMR values of 0.055 and 0.060, respectively, slightly exceed the ideal thresholds of 0.05, yet they remain within acceptable levels. All other indices fall within the recognized ideal range. CMB arises when both independent and correlated variables are measured using the same response

method, potentially compromising the validity of empirical findings and leading to erroneous conclusions (Kock et al., 2021; Liu et al., 2021). Accordingly, Harman's single-factor test and single-factor model CFA were used to check the CMB in the scale. The results, as shown in **Tables 4** and **6**, respectively, indicated that: 1) the variance explained by the first common factor extracted through principal component analysis was only 33.680%, falling below 40%; and 2) the one-factor model have poor fit, whereas the CFA model demonstrated better fit. Consequently, there is no serious CMB.

Table 6 Model fit indices of the model (N=124)

Indices	Accepted range		CFA model	One-factor model
	Satisfactory	Ideal		
Chi-square			251.311	837.396
d.f.			183	190
Chi-square/d.f.	⩽ 5.0	⩽ 3.0	1.373	4.407
GFI	⩾ 0.80	⩾ 0.90	0.837	0.481
RMSEA	⩽ 0.08	⩽ 0.05	0.055	0.166
RMR	⩽ 0.08	⩽ 0.05	0.039	0.126
IFI	⩾ 0.90	⩾ 0.90	0.949	0.510
CFI	⩾ 0.90	⩾ 0.90	0.947	0.502
TLI	⩾ 0.90	⩾ 0.90	0.940	0.450
SRMR	⩽ 0.08	⩽ 0.05	0.060	0.166

Note: The model fit indices of the structural equation model comply with the criteria outlined by Xiong et al. (2015) and Han et al. (2020).

4.4 Psychological distance differences

Table 7 shows the results of the one-way ANOVA, indicating that the differences in public perception of the four constructs, as well as construal level and behavioral intention, at different PDs are significant. Additionally, SPSS post-hoc multiple comparisons of public perception show that 1) the perceived risk of the local public is significantly higher than that of the general public and government officials. Additionally, the general public's perceived risk is higher than that of the government

officials, while this difference is not significant. Hence, *H1a* and *H4a* were validated. 2) The perceived economic benefits of the general public and government officials is significantly higher than that of the local public. Meanwhile, the perceived economic benefits of the government official are higher than that of the general public, while this difference is also not significant. Hence, *H1b* and *H4b* were validated. 3) The perceived fairness of the government official is significantly higher than the general public and the local public. The perceived fairness of the general public is also higher than that of the local public, while this difference is not statistically significant. Hence, *H4c* is validated. 4) Public acceptance has a significant increase from the local public to the general public and further to government officials. Hence, *H1d* and *H4d* are validated.

Table 7 Distance difference analysis of dimensions in the formal experiment

Construct	PD from the WTE facilities	Mean	Std. dev	F	Sig	Multiple comparisons
Perceived risk	1	3.10	0.757	13.216	0.000	1>2, 1>3
	2	2.42	0.669			
	3	2.32	0.792			
Perceived economic benefits	1	3.49	0.542	7.675	0.001	1<2, 1<3
	2	3.80	0.548			
	3	3.92	0.399			
Perceived fairness	1	3.81	0.606	4.620	0.012	1<2, 2<3
	2	3.91	0.506			
	3	4.15	0.419			
Public acceptance	1	3.13	0.731	22.471	0.000	1<2<3
	2	3.74	0.693			
	3	4.10	0.507			
Construal level	1	1.30	0.436	6.557	0.002	1<3, 2<3
	2	1.43	0.477			
	3	1.66	0.444			
Behavioral intention	1	1.45	0.355	10.695	0.000	1<3, 2<3
	2	1.55	0.299			
	3	1.75	0.236			

Note: as Table 1 note.

Similarly, SPSS post-hoc multiple comparisons show that both construal level and behavioral intention have a consistent pattern, with government officials demonstrating significantly higher levels than the general public and local residents, i.e., high social distance of power is congruent with high construal level and behavioral intentions. Moreover, the general public's construal level/behavioral intention is also higher than that of the local public, while this difference is not statistically significant. Hence, *H5* and *H6* are validated. Furthermore, inspired by Geng et al. (2018), an assessment is included to address potential challenges in opinion extraction. After completing three opinion statement tasks, participants evaluated the difficulty of extracting opinions and the ease of continuing the process. ANOVA results showed no significant differences of participant groups regarding the difficulty of extracting supportive or opposing opinions (P=0.558) and continuing the extraction process (P=0.585). Therefore, opinion extraction difficulty did not impact the experimental outcomes.

5 Discussion

Based on the data analysis above, this study provides empirical support for exploring the relationship between PD and cognition, demonstrating that varying PD significantly impact public perception. The findings indicate that, when examining differences in social distance – except perceived risk, perceived economic benefits, and public acceptance, which are all in line with expectations – the analysis of perceived fairness shows no significant difference (further t-test results: t=-0.783, P=0.436) between the "general public" (M=3.91) and "local public" (M=3.81), which differs from related physical distance research (e.g., Ren et al., 2016; Xu et al., 2023). To explore this deeper, the distance division standards proposed by Ren et al. (2016), Liu et al. (2018), and Xu et al. (2023) were used,

conducting a t-test on perceived fairness data from the spatial distance study immediately preceding the present study. The results demonstrate a significant difference in perceived fairness between local residents (within 3000 m) and the general public (beyond 3000 m) when using spatial distance as the benchmark (further t-test results: t=-12.990, P=0.000). One may speculate that the siting of WTE facilities in local communities, coupled with bearing the waste burden from other areas, directly amplifies the environmental burden in the locality, leading to unequal resource distribution among communities, encouraging a sense of relative deprivation and influencing the social equity awareness of residents (Besley, 2010; Liu et al., 2021). However, during the initiation of PD measurements, participants lacked factual experience and relevant knowledge, with 96.77% having no firsthand experience and 79.84% not even being aware of the facilities before the experiment, potentially contributing to the absence of significant differences in perceived fairness. On the other hand, as all participants were students, this demographic cohort has a notably optimistic attitude regarding trust in governmental institutions when juxtaposed with other demographic groups (Chen et al., 2015; Huang and Liu, 2018). Consequently, they are more inclined to believe that the government or decision-makers will genuinely present project-related information, as well as the scientific and practical feasibility of site selection, which provides another possible explanation for the absence of significant differences in perceived fairness assessments.

However, the findings regarding differences in the social distance of power are not entirely consistent with those of social distance. The results of the data analysis of perceived risk, economic benefits, fairness, and public acceptance are in line with experimental expectations; it is particularly noteworthy that the significant differences in perceived fairness, which were not validated in terms of social distance, were confirmed when the social distance of power was examined. The significant

differences observed after conferring power may be due to the perception or stereotype of power in the public mind. Power, typically viewed as a central determinant affecting resource allocation, decision making, and social status (Wang et al., 2014; Prechel, 2021), can thereby impact individuals' psychological states due to resulting disparities (Magee & Smith, 2013). Previous studies indicated that individuals with lower power may perceive unfairness more intensely due to their lower societal and organizational status, which, coupled with limited access to resources and opportunities, renders them more susceptible to unfair treatment (Magee & Smith, 2013; Power et al., 2020).

Meanwhile, these individuals may lack effective means to combat unfairness, making them more sensitive to its perception (Lois & Riedl, 2022). On the other hand, according to the approach-inhibition theory, individuals tend to have an "approach" tendency upon acquiring power, often feeling more capable and influential, leading to increased confidence and optimism regarding their circumstances and environment (Wang et al., 2014; Li et al., 2020). Conversely, those without or with less power may lean towards "inhibition" characteristics, anticipating threats and lacking rewards in their surroundings (Guinote, 2017; Li et al., 2020); thus, more prone to experience pronounced feelings of unfairness.

Similarly, the intensified influence and reinforced correlation between WTE facilities and the "local public," attributed to the narrowed social distance of power, have notably heightened their perception of potential environmental/health risks, aligning logically with findings on both physical distance (e.g., Cong et al., 2021b; Zhou et al., 2022) and social distance. It is worth noting that, despite the power disparity between the "general public" and "government officials," the "general public" is not directly affected by the negative externalities of WTE facilities. Accordingly, as indirect beneficiaries of facility construction and operation, the "general public" also can be regarded as the

529 category of vested interests, which may be another reasonable speculation for this outcome. Therefore,
530 the "not-my-concern" attitude towards losses and the "closely related" perception concerning gains
531 prompt the "general public" to perceive significantly lower risk and higher economic benefits than
532 the "local public," and even comparable to those of the "government officials."

533 Particularly noteworthy, the findings unexpectedly reveal that, although there is a certain
534 positive correlation trend between social distance and construal level as well as behavioral intention,
535 the differences therein lack statistical significance. Conversely, a significant positive correlation is
536 observed between social distance of power and construal level as well as behavioral intention, which
537 aligns with the conclusions from Magee and Smith (2013) and Geng et al. (2018). One possible
538 explanation for these differences may derive from the specificity of the study sample, that is,
539 individuals acting as the "general/local public" lack the related experience and knowledge before the
540 experimental stimulus was applied, potentially resulting in less tangible perceptions of siting of WTE
541 facilities, thereby potentially obscuring construal level and behavioral intention. Inherent sample size
542 limitations may be another possible explanation during data collection. Galinsky et al. (2003) have
543 pointed out that power can be activated as a concept in individuals' minds, and previous studies have
544 shown that individuals with higher power status tend to hold more positive and optimistic attitudes
545 towards the development of energy conversion facilities (Geng et al., 2018), thereby providing
546 evidential support for the differential results on social distance of power. Drawing upon CLT (Trope
547 & Liberman, 2010), this may be due to the increased association and perceived impact of the WTE
548 facilities with the self; that is, the experimental stimuli heightened participants' awareness of the
549 potential risks associated with the facility, leading to a closer PD and a shift towards a more concrete
550 construal (low-level construal) of the facility, focusing on tangible risks such as odor, noise, flames,

551 and smoke. Lima (2004) highlighted that such sensory stimuli as odors and noise are among the
552 primary factors the public perceives as danger.

553 Consequently, individuals in the "general/local public" role are more prone to developing a
554 heightened perception of environmental and health threats; thus, increasing the likelihood of opposing
555 the construction of WTE facilities in their vicinity. Furthermore, unlike situations involving
556 compensations for demolished houses, the construction of WTE facilities, given their environmental
557 positioning and image, is less likely to carry out relocation compensations for the majority of local
558 residents (Liu et al., 2021; Zhou et al., 2022). Even in the presence of potential economic
559 compensation schemes, their attachment to the community (Kaltenborn et al., 2023), property
560 devaluation (Liu et al., 2018), and negative anticipations of the facilities' impact on their lives (Wen
561 et al., 2022) may trigger perceptions of loss of benefits. Simultaneously, the notion that economic
562 compensation cannot fully offset potential losses may encourage strong aversive emotions, leading
563 to a heightened likelihood of negative perceptions and stronger NIMBY sentiments (Wen et al., 2022).
564 For example, Chung and Kim (2009) and Liu et al. (2021) found that higher perceptions of risk and
565 lower perceptions of economic benefits lead to decreased public acceptance of WTE facilities.
566 Therefore, this will further promote intentions to oppose the construction of WTE facilities.

567 Additionally, several studies indicate that individuals with high power have a heightened focus
568 on goal-relevant information, possess the capacity to forgo short-term gains for long-term benefits,
569 and engage in behaviors aligned with their objectives (e.g., Joshi & Fast, 2013). Therefore, it is further
570 speculated that, in addressing the challenge of 'waste besieging the city,' the decision to construct
571 WTE facilities is more closely aligned with the objective, leading individuals or groups with higher
572 power to show a preference for construction. Furthermore, the approach-inhibition theory suggests

that individuals with different power levels have varying information processing abilities during decision making, influenced by their inherent cognitive styles and behavioral pattern (Li et al., 2020). Hence, starting from the cognitive styles and behavioral patterns of government officials, the social distance of power associated with the "government officials" group tends to be greater, making it easier to adopt a higher-level construal that aligns with overarching goals such as societal well-being, urban environmental improvement, and enhanced efficiency in municipal solid waste management through the construction of WTE facilities. Consequently, individuals within this experimental group have higher perceived economic benefits, fairness, and public acceptance, thereby being more prone to generating favorable opinions and intentions conducive to social development and positive perceptions (Yao et al., 2020; Li et al., 2020), aligning with behavioral logic.

6 Conclusions, implications, and limitations

6.1 Conclusions

In studies related to the distance differences of NIMBY infrastructure, they have tended to emphasize the impact of physical distance differences on public perception, with less attention given to the influence of PD differences. However, the result of the current study provided an interesting insight into the effect of PD on public perception of WTE facilities, enriching the understanding of "distance" in public perception distance differences research, as well as not limiting itself to a particular public perception, but further exploring the differences in public perceptions from multiple dimensions.

The findings indicate that PD, encompassing social distance and social distance of power, plays a significant role in shaping public perception of WTE facilities. Specifically, they provide further support for the "ripple effect," demonstrating that closer PD is associated with higher public risk

perception and lower perceived economic benefits, fairness, and public acceptance. When individuals or groups perceive closer social distance of power, they tend to adopt concrete and goal-relevant mental representations, indicating a lower construal level, and are more inclined to support the construction of WTE facilities. Taken together, the present study further corroborated the CLT proposed by Trope and Liberman (2000) and the social distance theory of power posited by Magee and Smith (2013).

6.2 Implications

Given the substantial influence resulting from power differentials between decision-makers and the public regarding the public perception of WTE facilities, one may predict that whether the gap in public perception between these two entities can be narrowed is an important challenge for future global WTE combustion development. One primary advantage of this study is its potential to facilitate risk communication among the government, operators, and the public regarding WTE facilities. Risk communication, a bidirectional form of information exchanges whose effectiveness relies on mutual information sharing between both parties (Geng et al., 2018), often encounters inequality in the siting of WTE facilities. The public typically assumes the role of recipient and seeker of information. Meanwhile, the government and operating companies play the role of decision-makers and information providers for the public in the siting and construction of WTE facilities, and having a vested interest in the construction and operation of such facilities, creating a risk of binding interests (Bian et al., 2021), leading to public distrust, increased risk aversion, and the subsequent development of negative attitudes and oppositional intentions. With the increasing awareness of environmental protection, the traditional “top-down” governance approach, characterized by “officialdom” and

615 “autocracy,” has shown its limitations when making decisions regarding the siting of WTE facilities
616 (Ren et al., 2016; Liu et al., 2021). Therefore, transitioning towards a “bottom-up” governance
617 concept characterized by negotiated governance is advocated. Specifically, in decision-making
618 processes, governments need to prioritize the public’s right to expression and information, ensure the
619 pivotal role of the public, and facilitate their organized participation in supervision, thereby
620 minimizing the power gap.

621 Consequently, this necessitates the establishment of standardized and comprehensive
622 mechanisms for information disclosure (Cong et al., 2021b), enhancing transparent communication
623 between government officials and the public regarding WTE facilities (Geng et al., 2018). In detail,
624 official platforms and channels should be established to scientific introduce various waste treatment
625 technologies and the actual situation of the operation. Through specific cases and data, multiple
626 measures such as WTE combustion, landfill gas-to-energy, and spontaneous combustion of landfilled
627 waste should be compared by providing accurate disclosures of hazardous substance emissions and
628 highlighting the advantages of each treatment method (e.g., space requirements, hazardous chemicals,
629 and bacterial disposal). Additionally, proactive promotion of those information, including official
630 platforms and scientific information, should be undertaken. Utilizing diverse forms of communication,
631 particularly in the current era of new media, can subtly help the public understand and recognize
632 relevant treatment technologies. Providing scientific data can counteract stereotypes and alleviate the
633 fear of the unknown that contributes to NIMBY sentiments and public opposition, thereby ensuring
634 that the public has accessible channels to query and understand the relevant information. Moreover,
635 it is important to establish sincere face-to-face communication channels with the public, addressing
636 and promptly responding to reasonable demands from local residents. Accordingly, enhancing the

637 roles of social organizations, media, and experts as coordinators is critical in establishing effective
638 communication bridges between the government and the public, thereby encouraging a collaborative
639 governance framework throughout society (Bian et al., 2021) and progressively advancing whole
640 process public engagement.

641 On the other hand, considering the variations in public perceptions between local and general
642 populations revealed by the findings of this study, it is recommended to establish a diversified
643 compensation mechanism. Local governments should implement personalized compensation
644 measures based on different public perceptions and loss of interests of residents in different
645 geographical areas, thereby preventing or mitigating sentiments of unfairness, deprivation, and
646 neglect by residents, ultimately promoting a cohesive community and shared interests (e.g., Besley,
647 2010; Liu et al., 2018b; Xu et al., 2023). Furthermore, addressing the issue at its root by guiding
648 enterprises to assume their primary stakeholder responsibilities is needed. Involving the establishment
649 of mandatory legal constraints, and reward and penalty systems, broadening channels for public
650 oversight and grievances, and underlining the indispensable role of public scrutiny in the routine
651 functioning of enterprises (Cong et al., 2021b; Zhou et al., 2022), these measures are geared towards
652 bolstering corporate self-discipline.

653 **6.3 Limitations**

654 Although the study empirically explored the influence of PD on public perception through the lens of
655 social distance and social distance of power, it is limited by only dividing PD into high and low,
656 lacking any discussion of intermediate or more other levels of PD, which could benefit from further
657 inclusion of more detailed division and analysis of the potential relevance or distance law of PD as

well. Meanwhile, using a direct manipulation approach to manipulate PD, the study relied on survey experimental methods for sample data collection. This resulted in a lack of real-time participant responses to experimental text and video materials, thereby limiting the depth of understanding regarding public perception. Future research could benefit from integrating technologies such as eye-tracking and electroencephalogram measurements into behavioral investigation experiments to obtain real-time data. Additionally, no specific hazardous substance emissions data comparison between WTE facilities and landfills was conducted of the experimental materials, which is a limitation of this study. Future research could benefit from considering the effect of scientific information on shortening the PD and reducing to prevalent NIMBY opposition to badly needed infrastructure projects.

References

Achillas C, Vlachokostas C, Moussiopoulos N, Banias G, Kafetzopoulos G, Karagiannidis A (2011). Social acceptance for the development of a waste-to-energy plant in an urban area. Resour Conserv Recycl, 55(9-10):857-863. https://doi.org/10.1016/j.resconrec.2011.04.012

Aslam A, Rana IA (2022) Impact of the built environment on climate change risk perception and psychological distancing: Empirical evidence from Islamabad Pakistan. Enviro Sci Policy 127:228-240. https://doi.org/10.1016/j.envsci.2021.10.024

Baxter J, Ho Y Rollins Y, Maclaren V (2016) Attitudes toward waste to energy facilities and impacts on diversion in Ontario Canada. Waste Manage 50(Apr):75-85. https://doi.org/10.1016/j.wasman.2016.02.017

Besley JC (2010) Public engagement and the impact of fairness perceptions on decision favorability

679 and acceptance. Sci Commun 32(2):256-280. https://doi.org/10.1177/10755470093586
680 Bian Q, Han Z, Veuthey J, Ma B (2021) Risk perceptions of nuclear energy climate change and
681 earthquake: How are they correlated and differentiated by ideologies? Clim Risk Manag
682 32:100297. https://doi.org/10.1016/j.crm.2021.100297
683 Boait PJ, Rylatt RM, Stokes M (2006) Optimisation of consumer benefits from micro Combined Heat
684 and Power. Energ Buildings 38(8):981-987. https://doi.org/10.1016/j.enbuild.2005.11.008
685 Boudet H, Clarke C, Bugden D, Maibach E, Roser-Renouf C, Leiserowitz A (2014) "Fracking"
686 controversy and communication: Using national survey data to understand public perceptions of
687 hydraulic fracturing. Energ Policy 65:57-67. https://doi.org/10.1016/j.enpol.2013.10.017
688 Carlisle JE, Kane SL, Solan D, Bowman M, Joe JC (2015) Public attitudes regarding large-scale solar
689 energy development in the US. Renew Sust Energ Rev 48:835-847.
690 https://doi.org/10.1016/j.rser.2015.04.047
691 Carmi N, Kimhi S (2015) Further than the eye can see: Psychological distance and perception of
692 environmental threats. Hum Ecol Risk Assess 21(8):2239-2257.
693 https://doi.org/10.1080/10807039.2015.1046419
694 Chen H, Zheng G, Li M et al (2015) A study on internet usage public event attention information
695 disclosure evaluation and government trust. Journalism Research (03):24-29+23. (In Chinese)
696 Chen S, Lee-Chai AY, Bargh JA (2001) Relationship orientation as a moderator of the effects of social
697 power. J Pers Soc Psychol 80(2):173. https://doi.org/10.1037/0022-3514.80.2.173
698 Chen Y, Zhang J, Tadikamalla PR Gao X (2019) The relationship among government enterprise and
699 public in environmental governance from the perspective of multi-player evolutionary game. Int
700 J Env Res Pub He 16(18):3351. https://doi.org/10.3390/ijerph16183351

Chung JB, Kim HK (2009) Competition economic benefits trust and risk perception in siting a potentially hazardous facility. Landsc Urban Plan 91(1):8-16. https://doi.org/10.1016/j.landurbplan.2008.11.005

Colquitt JA (2001) On the dimensionality of organizational justice: A construct validation of a measure. J Appl Psychol 86(3):386-400. https://doi.org/10.1037//0021-9010.86.3.386

Cong X, Ma L, Wang L, Šaparauskas J, Górecki J, Skibniewski MJ (2021a) The early warning system for determining the "not in My Back Yard" of heavy pollution projects based on public perception. J Clean Prod 282:125398. https://doi.org/10.1016/j.jclepro. 2020.125398

Cong X, Wang L, Ma L, Skibnewski M (2021b) Exploring critical influencing factors for the site selection failure of waste-to-energy projects in China caused by the "not in my back yard" effect. Eng Constr Archit Ma. https://doi.org/10.1108/ECAM-12-2019-0709

Cui Y, Mou J, Cohen J, Liu Y, Kurcz K (2020) Understanding consumer intentions toward cross-border m-commerce usage: A psychological distance and commitment-trust perspective. Electron Commer Res Appl 39:100920. https://doi.org/10.1016/j.elerap.2019.100920

Edelstein MR (2004) Sustainable innovation and the siting dilemma: thoughts on the stigmatization of projects and proponents good and bad. J Risk Res 7(2):233-250. https://doi.org/10.1080/1366987042000158730

Frantál B, Malý, ‚J Ouředníček M, Nemeškal J (2016) Distance matters. Assessing socioeconomic impacts of the Dukovany nuclear power plant in the Czech Republic: Local perceptions and statistical evidence. Morav Geogr Rep 24(1):2-13. https://doi.org/10.1515/mgr-2016-0001

Galinsky AD, Gruenfeld DH, Magee JC (2003) From power to action. J Pers Soc Psychol 85(3):453. https://doi.org/10.1037/0022-3514.85.3.453

Ge Y, Cui C, Zhang C, Ke Y, Liu, Y (2020) Testing a social-psychological model of public acceptance towards highway infrastructure projects: a case study from China. Eng Constr Archit Ma 28(9):2772-2787. https://doi.org/10.1108/ECAM-03-2020-0183

Geng L, Liu T, Zhou K, Yang G (2018) Can power affect environmental risk attitude toward nuclear energy? Energy Policy 113:87-93. https://doi.org/10.1016/j.enpol.2017.10.051

Giordano A, Anderson S, He X (2010) How near is near? The distance perceptions of residents of a nuclear emergency planning zone. Environ Hazards 9(2):167-182. https://doi.org/10.3763/ehaz.2010.0031

Glaeser EL, Laibson, DI Scheinkman JA, Soutter CL (2000) Measuring trust. QJ Econ 115(3):811-846. https://doi.org/10.1162/003355300554926

Guinote A (2017) How power affects people: Activating wanting and goal seeking. Annu Rev Psychol 68:353-381. https://doi.org/10.1146/annurev-psych-010416-044153

Hair JF (2009) Multivariate data analysis.

Hair JF, Risher JJ, Sarstedt M, Ringle CM (2020) Structural equation modeling approach to studying the relationships among safety investment construction employees' safety cognition and behavioral performance. J Constr Eng Manag 146(7):04020065. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001858

Huang J, Li Y, Zhang H (2015) The application and development of construal level theory. Advances in Psychological Science 23(1):110. (In Chinese)

Huang L, He R, Yang Q, Chen J, Zhou Y, Hammitt JK, Lu X, Bi J, Liu Y (2018) The changing risk perception towards nuclear power in China after the Fukushima nuclear accident in Japan. Energy Policy 120:294-301. https://doi.org/10.1016/j.enpol.2018.05.007

745 Huang Q, Liu H (2018) Analysis of multilevel government trust model and its influencing factors.
746 Issues of contemporary world socialism (02):148-153. (In Chinese)
747 Huijts NM, Contzen N, Roeser S (2022). Unequal means more unfair means more negative emotions?
748 Ethical concerns and emotions about an unequal distribution of negative outcomes of a local
749 energy project. Energ Policy, 165:112963. https://doi.org/10.1016/j.enpol.2022.112963
750 Joshi PD, Fast NJ (2013) Power and reduced temporal discounting. Psychol Sci 24(4):432-438.
751 https://doi.org/10.1177/0956797612457
752 Kaltenborn BP, Keller R, Krange O (2023) Attitudes toward wind power in Norway–solution or
753 problem in renewable energy development? Environ Manage 72(5):922-931.
754 https://doi.org/10.1007/s00267-023-01870-5
755 Kasperson RE, Renn O, Slovic P, Brown HS, Emel J, Goble R, Kasperson JX, Ratick S (1988) The
756 social amplification of risk: A conceptual framework. Risk Anal 8(2):177-187.
757 https://doi.org/10.1111/j.1539-6924.1988.tb01168.x
758 Kock F, Berbekova A, Assaf AG (2021) Understanding and managing the threat of common method
759 bias: Detection prevention and control. Tour Manag 86:104330.
760 https://doi.org/10.1016/j.tourman.2021.104330
761 Lammers J, Galinsky AD, Gordijn EH Otten S (2008) Illegitimacy moderates the effects of power on
762 approach. Psychol Sci 19(6):558-564. https://doi.org/10.1111/j.1467-9280.2008.021
763 Lammers J, Galinsky AD, Gordijn EH, Otten S (2012) Power increases social distance. Soc Psychol
764 Personal Sci 3(3):282-290. https://doi.org/10.1177/1948550611418679
765 Lee SJ (2019) The role of construal level in message effects research: A review and future directions.
766 Commun Theory 29(3):319-338. https://doi.org/10.1093/ct/qty030

767 Li X, Liu P, Xiao C, Wang X, Li A (2020) How does power in organizations promote prosocial
768 behavior? The mediating role of sense of responsibility. Advances in Psychological Science
769 28(09):1586-1598. (In Chinese)
770 Li YD, Zou AQ (2021). Game model between the public and government agents in NIMBY projects:
771 From the perspective of fairness perception. Management Review, 33(07):313-325.(in Chinese)
772 Liberman N, Trope Y (1998) The role of feasibility and desirability considerations in near and distant
773 future decisions: A test of temporal construal theory. J Pers Soc Psychol 75(1):5.
774 https://doi.org/10.1037/0022-3514.75.1.5
775 Liberman N, Trope Y (2008) The psychology of transcending the here and now. Science
776 322(5905):1201-1205. https://doi.org/10.1126/science.1161958
777 Liberman N, Trope Y (2014) Traversing psychological distance. Trends Cogn Sci 18(7):364-369.
778 https://doi.org/10.1016/j.tics.2014.03.001
779 Lima ML (2004) On the influence of risk perception on mental health: Living near an incinerator. J
780 Environ Psychol 24(1):71-84. https://doi.org/10.1016/S0272-4944(03)00026-4
781 Lin S, Cheung SO (2022) Exploring the concept of psychological distance and its impact on intention
782 to settle in construction dispute negotiation. J Constr Eng Manag 148(12):04022133.
783 https://doi.org/10.1061/(ASCE)CO.1943-7862.0002418
784 Liu Y, Cui C, Zhang C, Xia B, Chen Q, Skitmore M (2020) Effects of economic compensation on
785 public acceptance of waste-to-energy incineration projects: An attribution theory perspective. J
786 Environ Plann Man 64(9):1515-1535. https://doi.org/10.1080/09640568.2020.1834366
787 Liu Y, Sun C, Xia B, Cui C, Coffey V (2018a) Impact of community engagement on public acceptance
788 towards waste-to-energy incineration projects: Empirical evidence from China. Waste

789 Manage:431-442. https://doi.org/10.1016/j.wasman.2018.02.028
790 Liu Y, Xu M, Ge Y, Cui C, Xia B, Skitmore M (2021) Influences of environmental impact assessment
791 on public acceptance of waste-to-energy incineration projects. J Clean Prod 304:127062.
792 https://doi.org/10.1016/j.jclepro.2021.127062
793 Liu Y, Ge Y, Xia B, Cui C, Jiang X, Skitmore M (2019) Enhancing public acceptance towards waste-
794 to-energy incineration projects: lessons learned from a case study in China. Sustain Cities Soc
795 48:101582. https://doi.org/10.1016/j.scs.2019.101582
796 Liu Z, Liao L, Mei C (2018b) Not-in-my-backyard but let's talk: Explaining public opposition to
797 facility siting in urban China. Land Use Policy 77:471-478.
798 https://doi.org/10.1016/j.landusepol.2018.06.006
799 Liu Z, Liu J, Sun M (2022) Emotional responses and behavioral coping mechanism to sufferers'
800 privacy leakage among Chinese internet users during public health emergencies. Chinese Journal
801 of Public Health 38(5):624-628. (In Chinese)
802 Lois G, Riedl A (2022) Interplay between different forms of power and meritocratic considerations
803 shapes fairness perceptions. Sci Rep 12(1):11428. https://doi.org/101038/s41598-022-15613-9
804 Magee JC, Smith PK (2013) The social distance theory of power. Pers Soc Psychol Rev 17(2):158-
805 186. https://doi.org/10888683124727
806 Mourali M, Nagpal A (2013) The powerful select the powerless reject: Power's influence in decision
807 strategies. J Bus Res 66(7):874-880. https://doi.org/10.1016/j.jbusres.2011.12.005
808 Ng SH (1980) The social psychology of power.Magee JC (2020) Power and social distance. Curr
809 Opin Psychol 33:33-37. https://doi.org/10.1016/j.copsyc.2019.06.005
810 Overbeck JR, Park B (2001) When power does not corrupt: superior individuation processes among

powerful perceivers. J Pers Soc Psychol 81(4):549. https://doi.org/10.1037/0022-3514.81.4.549

Phakiti A (2018) Confirmatory factor analysis and structural equation modeling. The Palgrave Handbook of Applied Linguistics Research Methodology:459-500. https://doi.org/doi.org/10.1057/978-1-137-59900-1_21

Power SA, Madsen T, Morton TA (2020) Relative deprivation and revolt: current and future directions. Curr Opin Psychol 35:119-124. https://doi.org/doi.org/10.1016/j.copsyc.2020.06.010

Prechel H (2021) Beyond the undertheorized role of organizational power as political power in theories of the state. Sociol Compass 15(7):e12890. https://doi.org/10.1111/soc4.12890

Qu Z, Lu Y (2016) Finding the essence and iterative logic of public perception. Studies in Dialectics of Nature 32(04):96-101. (In Chinese)

Ren X, Che Y, Yang K, Tao Y (2016) Risk perception and public acceptance toward a highly protested Waste-to-Energy facility. Waste Manage 48:528-539. https://doi.org/10.1016/j.wasman.2015.10.036

Ross VL, Fielding KS, Louis WR (2014) Social trust risk perceptions and public acceptance of recycled water: Testing a social-psychological model. J Environ Manage 137:61-68. https://doi.org/10.1016/j. jenvman.2014.01.039

Schively C (2007) Understanding the NIMBY and LULU phenomena: Reassessing our knowledge base and informing future research. J Plan Lit 21(3):255-266. https://doi.org/10.1177/0885412206295845

Schleich J, Faure C (2017) Explaining citizens' perceptions of international climate-policy relevance. Energy Policy 103:62-71. https://doi.org/10.1016/j.enpol.2017.01.014

Shah P, Yang JZ, Kahlor L (2023) Psychological distance risk perception and affect: Texas residents' support for carbon capture and storage. J Risk Res 26(2):184-198.

https://doi.org/10.1080/13669877.2022.211608

Shang Z (2018) Study on disaster acceptable risk based on psychological distance. Journal of Catastrophology 2018 33(03):12-16+28. (In Chinese)

Shen L, Yang Y, Bao H, Du X, He H (2023) Residents' perceptions on the urban resources environment in Chinese large cities. Environ Impact Assess Rev 100:107080. https://doi.org/10.1016/j.eiar.2023.107080

Slovic P (1987) Perception of risk. Science 236(4799):280-285. https://doi.org/10.1126/science.3563507

Slovic P, Flynn JH, Layman M (1991) Perceived risk trust and the politics of nuclear waste. Science 254(5038): 1603-1607. https://doi.org/10.1126/science.254.5038.1603

Soderberg CK, Callahan SP, Kochersberger AO, Amit E, Ledgerwood A (2015) The effects of psychological distance on abstraction: Two meta-analyses. Psychol Bull 141(3):525. https://doi.org/10.1037/bul0000005

Soni A (2018) Out of sight out of mind? Investigating the longitudinal impact of the Fukushima nuclear accident on public opinion in the United States. Energy Policy 122:169-175. https://doi.org/10.1016/j.enpol.2018.07.024

Sun C, Meng X, Ouyang X, Xu M (2023) Social cost of waste-to-energy (WTE) incineration siting: From the perspective of risk perception. Environ Impact Assess Rev 102:107204. https://doi.org/10.1016/j.eiar.2023.107204

Sun Q, Liu Y, Zhang H, Lu J (2017) Increased social distance makes people more risk-neutral. J Soc Psychol 157(4):502-512. https://doi.org/10.1080/00224545.2016.1242471

Tan H, Wong-Parodi G, Xu J (2020) Not under my backyard? Psychological distance local acceptance and shale gas development in China. Energy Res Soc Sci 61:101336.

https://doi.org/10.1016/j.erss.2019.101336

Thibaut JW, Walker L (1975) Procedural justice: A psychological analysis. Duke Law J 1977(6). https://doi.org/10.2307/ 1371953

Trope Y, Liberman N (2000) Temporal construal and time-dependent changes in preference. J Pers Soc Psychol 79(6):876. https://doi.org/10.1037/0022-3514.79.6.876

Trope Y, Liberman N (2010) Construal-level theory of psychological distance. Psychol Rev 117(2):440. https://doi.org/10.1037/a0018963

Trope Y, Liberman N (2011) Construal level theory. Handbook of Theories of Social Psychology 1:118-134.

Trope Y, Liberman N, Wakslak C (2007) Construal levels and psychological distance: Effects on representation prediction evaluation and behavior. J Consum Psychol 17(2):83-95. https://doi.org/10.1016/S1057-7408(07)70013-X

Tsai FS, Chang WW, Lee CC (2021) A social condition-enhanced network for recognizing power distance using expressive prosody and intrinsic brain connectivity. IEEE Trans Multimedia 24:2046-2057. https://doi.org/10.1109/TMM.2021.3075091

Visschers VH, Siegrist M (2012) Fair play in energ policy decisions: Procedural fairness, outcome fairness and acceptance of the decision to rebuild nuclear power plants. Energ policy 46:292-300. https://doi.org/10.1016/j.enpol.2012.03.062

Wang S, Hurlstone MJ, Leviston Z, Walker I, Lawrence C (2021) Construal-level theory and psychological distancing: Implications for grand environmental challenges. One Earth 4(4):482-486. https://doi.org/10.1016/j.oneear.2021.03.009

Wang S, Wang J, Lin S, Li J (2019) Public perceptions and acceptance of nuclear energy in China:

The role of public knowledge, perceived benefit, perceived risk and public engagement. Energ Policy 126:352-360. https://doi.org/10.1016/j.enpol.2018.11.040

Wang X, Cai W, Sun J, Wu S, Feng Z, Jin S (2014) The theoretical development and comparison of power: From the perspective of social psychology. Advances in Psychological Science (2014 22(01):139-149. (In Chinese)

Wang Y, Tang Y, Zuo J, Bartsch K (2022) Exploring rumor combating behavior of social media on NIMBY conflict: Temporal modes, frameworks and strategies. Environ Impact Assess Rev 96:106839. https://doi.org/10.1016/j.eiar.2022.106839

Wen H, Li S, Hui EC, Xiao Y, Liu H (2022) Externality impacts of "Not in My Backyard" facilities on property values: Evidence from the Hangzhou waste sorting and reduction complex projects. Habitat Int 125:102583. https://doi.org/10.1016/j.habitatint.2022.102583

Wiesenfeld BM, Reyt JN, Brockner J, Trope Y (2017) Construal level theory in organizational research. Annu Rev Organ Psychol Organ Behav 4:367-400. https://doi.org/10.1146/annurev-orgpsych-032516-113115

Woo A, Joh K, Yu CY (2021) Who believes and why they believe: Individual perception of public housing and housing price depreciation. Cities 109:103019. https://doi.org/10.1016/j.cities.2020.103019

Wu Y, Zhou Y, van Dijk E, Leliveld MC, Zhou X (2011) Social comparison affects brain responses to fairness in asset division: an ERP study with the ultimatum game. Front Hum Neurosci 5:131. https://doi.org/10.3389/fnhum.2011.00131

Xie XF, Stone E, Zheng R, Zhang RG (2011) The 'Typhoon Eye Effect': Determinants of distress during the SARS epidemic. J Risk Res 14(9):1091-1107. https://doi.org/10.1080/13669877.2011.571790

Xiong B, Skitmore M Xia B (2015) A critical review of structural equation modeling applications in

899 construction research. Automat Constr 49:59-70. https://doi.org/10.1016/j.autcon.2014.09.006
900 Xu M, Lin B (2023) Accessing people's attitudes towards garbage incineration power plants:
901 Evidence from models correcting sample selection bias. Environ Impact Assess Rev 99:107034.
902 https://doi.org/10.1016/j.eiar.2022.107034
903 Xu M, Liu Y, Cui C, Xia B, Ke Y, Skitmore M (2023) Social acceptance of NIMBY facilities: A
904 comparative study between public acceptance and the social license to operate analytical
905 frameworks. Land Use Policy 124:106453. https://doi.org/10.1016/j.landusepol.2022.106453
906 Yang JZ, McAllister C (2020) Closer to the heart closer to the mind: using psychological distance to
907 communicate a measles outbreak. J Health Commun 25(11):895-902.
908 https://doi.org/10.1080/10810730.2020.1851822
909 Yao Q, Wu Z, Zhang C, Fu G (2020) Effect of power on conspicuous prosocial behavior Acta
910 Psychologica Sinica 52(12):1421-1435. (In Chinese)
911 Zhang Z, Lin Y (2023). Impact of perceived social justice on public acceptance toward waste disposal
912 facilities: Evidence from China. Environ Impact Assess Rev 101:107157.
913 https://doi.org/10.1016/j.eiar.2023.107157
914 Zheng R, Rao LL, Zheng XL, Cai C, Wei ZH, Xuan YH, Li S (2015) The more involved in lead-zinc
915 mining risk the less frightened: A psychological typhoon eye perspective. J Environ Psychol
916 44:126-134. https://doi.org/10.1016/j.jenvp. 2015.10.002
917 Zhong Y, Chen X, Yan X (2013) The influence of the level of personal power on loss aversion. Psychol
918 Sci 36:429–433. (In Chinese)
919 Zhou Q, Xu M, Liu Y, Cui C, Xia B, Ke Y, Skitmore M (2022) Exploring the effects of spatial distance
920 on public perception of waste-to-energy incineration projects. Waste Manage 143:168-176.

https://doi.org/10.1016/j.wasman.2022.02.033

Zu L, Wu D, Lyu S (2024) How to move from conflict to opportunity in the not-in-my-backyard dilemma: A case study of the Asuwei waste incineration plant in Beijing. Environ Impact Assess Rev 104:107326. https://doi.org/10.1016/j.eiar.2023.107326