

Waste Management Interpreting Prohibition Signage: Symbolic Interactionism and Household Waste Compliance

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Abstract

Household waste management in residential areas often relies on prohibition signage as an environmental communication tool, yet its effectiveness in shaping residents' compliance remains uneven. This study examines how prohibition signage operates as a symbolic form of environmental communication and how residents interpret and respond to it in everyday waste management practices. Using a qualitative case study approach, the research was conducted in the Villa Kintamani residential area, Tamansari Village, Setu Subdistrict, Bekasi Regency. Data were collected through in-depth interviews, non-participant observation, and analysis of community documents, and were analyzed thematically using a symbolic interactionist framework. The findings reveal that prohibition signage does not function as a self-evident or universally binding rule. Instead, its meaning is constructed through social interaction, shaped by perceived legitimacy of authority, situational and spatial contexts, and collective experiences within the community. Compliance tends to emerge when signage is interpreted as representing shared norms and collective responsibility, while signage perceived as an external or impersonal control mechanism results in situational or inconsistent adherence. By contrasting these findings with cognitive-linear models of signage effectiveness, the study demonstrates that residents' compliance is a socially negotiated outcome rather than a direct response to visual instruction. The study contributes theoretically by extending symbolic interactionism into environmental communication research and offers practical insights for designing more participatory and context-sensitive waste management communication strategies.

Keywords: Compliance, Environmental Communication, Household Waste Management, Prohibition Signage, Symbolic Interactionism

1. Introduction

Household waste management remains one of the most persistent “everyday” environmental problems because its success depends less on technology and more on routine compliance at the point of disposal, where small repeated actions accumulate into visible environmental outcomes [1], [2]. Recent behavioral research shows that even when people express pro-environmental attitudes, improper disposal and littering can persist due to situational cues, convenience, and weak moral activation in the moment of action [3], [4]. Because many disposal decisions are made quickly, communication interventions that operate as immediate cues rather than as long explanatory messages are increasingly treated as a practical policy lever in waste governance [5], [6]. Within this landscape, prohibition signage “Do not litter,” “No

dumping.” “Do not throw mixed waste” is more than a regulatory reminder because it functions as environmental communication that frames what counts as acceptable conduct in a shared space [7], [8]. Field and quasi-field studies indicate that signage can reduce littering or improve sorting when it is legible, visually salient, and cognitively light, especially in contexts where the requested behavior is already socially expected [9]. Experimental evidence also suggests that point-of-disposal informational signage can reduce recycling contamination by shaping decision heuristics at the bin, which is precisely where compliance failures are most likely to occur [10]. However, the same body of research warns that “what works” depends on how people interpret the sign, who they believe is addressed by it, and whether the message aligns with local norms and identities rather than feeling external or moralizing [11]. Studies on anti-littering and pollution prevention consistently highlight the mediating role of moral norms and personal responsibility, implying that a prohibition sign can be effective when it activates self-accountability rather than fear of punishment alone [12].

From a symbolic interactionist standpoint, this interpretive layer becomes central because signage is read through shared meanings that residents negotiate in everyday interactions, including what “good residents” do and what behaviors mark someone as irresponsible in a neighborhood. In other words, prohibition signage operates as a symbol that not only communicates a rule but also signals a social definition of the situation, where waste disposal becomes a moralized public act rather than a private household matter. Behavioral evidence supports this symbolic argument by showing that normative cues, place attachment, and perceived responsibility shape intentions to avoid littering, making compliance partly an identity and belonging issue. In the household waste context, participation is also shaped by structural and motivational conditions such as incentives, institutional clarity, and perceived feasibility so signage interacts with broader governance arrangements instead of substituting for them [13].

Recent work on waste minimization further suggests that “informational tools” can work differently depending on social network structures and information diffusion, implying that signage may be amplified or weakened by neighborhood talk, observation, and local enforcement cultures [14]. This matters because signage is often interpreted collectively: residents notice whether others comply, whether the rule is enforced, and whether the message represents a shared commitment or merely bureaucratic decoration [15]. Research on community and institutional settings also indicates that environmental norms are reinforced when communication materials are consistent with visible infrastructure (bins, collection schedules, sorting categories), which helps translate meaning into practice [16].

At the same time, empirical work shows that recycling and litter interventions can produce modest or mixed effects when the message is too abstract or when cleanliness is evaluated subjectively rather than through objective waste reduction, underscoring the need to measure “compliance” carefully. A complementary stream of studies demonstrates that digital and campaign-based behavior change can raise engagement temporarily, but sustaining compliance requires embedding pro-environmental actions into routine social practice [17]. Accordingly, a symbolic interactionist analysis is useful because it can explain not only whether residents obey prohibition signage, but how they talk about it, display compliance, interpret violations, and reproduce meanings through interaction in daily household waste management. This interpretive focus is especially relevant in urban residential settings where waste problems are experienced as neighborhood disorder and where signage becomes part of the “communication environment” shaping shared expectations. Evidence from consumer and retail contexts likewise suggests that signs and symbols can influence “recycling-related” behavior through semiotic understanding and perceived argument quality, supporting the idea that signage works through meaning-making rather than

coercion alone [18]. A recent marketing field and survey literature also indicates that environmental communication frames (including moral framing) can shift willingness to engage in sustainability-related behaviors, which parallels how prohibition signage frames household disposal as a socially accountable act [19]. Finally, scholarship in participatory development communication in household waste management co-authored by V.Sidharta et al (2021-2023), shows that resident participation and communication processes are central to household waste governance, reinforcing the need to treat signage as one element within a broader symbolic and participatory ecology [20], [21].

2. Research Methodology

Research Design

This study adopts a qualitative research approach using a case study design to examine how prohibition signage functions as environmental communication symbols and how such symbols shape residents' compliance in household waste management. A qualitative approach is appropriate because the study seeks to understand meanings, interpretations, and social processes rather than to measure causal effects or behavioral frequencies. In line with interpretive research traditions, the focus is placed on how residents construct, negotiate, and enact meanings related to signage within their everyday social interactions. The case study design is particularly suitable because it allows for an in-depth exploration of a bounded social setting in which environmental rules, visual communication, and routine practices intersect. Case studies are effective for investigating complex, context-dependent phenomena where the boundaries between the phenomenon and its environment are not clearly evident. In this research, prohibition signage is treated not merely as a physical object but as a socially embedded symbol whose meaning emerges through interaction within a specific residential context [22].

Research Site

The study was conducted in Villa Kintamani Residential Area, located in Tamansari Village, Setu Subdistrict, Bekasi Regency, Indonesia. This site was selected based on its distinctive characteristics as a residential environment that actively employs internal regulations on household waste management and makes consistent use of prohibition signage in public and semi-public spaces. The residential area represents a socially meaningful setting where waste management rules are communicated not only through formal announcements but also through visual symbols embedded in everyday spaces such as streets, waste disposal points, and communal areas. The presence of internal community governance structures (e.g., neighborhood management or RT/RW) further provides a relevant context for examining how signage is interpreted in relation to perceived authority, legitimacy, and shared norms. Such characteristics make the site analytically appropriate for exploring the symbolic and interactional dimensions of environmental communication.

Unit of Analysis and Research Participants

The unit of analysis in this study is residents' compliance behavior in household waste management, understood in relation to their interpretation of prohibition signage as a symbol of environmental communication. Rather than focusing on signage as an isolated artifact, the analysis centers on the social meanings attributed to signage and how these meanings inform everyday practices. Research participants consist of two main groups:

1. Residents who routinely encounter and respond to prohibition signage in their daily activities.
2. Community administrators or environmental managers (such as RT/RW representatives) who are in

involved in establishing, maintaining, or enforcing waste management rules.

Participants were selected using purposive sampling, guided by the following criteria:

1. Residents who had lived in the area for at least one year
2. Residents who had regular exposure to prohibition signage related to waste management
3. Individuals who were aware of local waste management rules
4. Community administrators involved in environmental governance.

To enrich the diversity of perspectives, purposive sampling was complemented by snowball sampling, particularly to identify residents with notable experiences related to compliance, conflict, or community discussions about waste management. The number of participants was determined by information saturation, meaning data collection continued until additional interviews no longer generated substantively new insights [23].

Data Collection and Data Analysis

Data were collected through three complementary techniques to enable triangulation:

1. In-depth semi-structured interviews
Interviews were conducted to explore residents' perceptions of prohibition signage, their interpretations of its meaning, perceived legitimacy, and its influence on their waste disposal practices. Open-ended questions encouraged participants to describe concrete experiences, situational judgments, and social interactions related to compliance.
2. Non-participant observation
Observations focused on the placement, visibility, and physical condition of prohibition signage, as well as residents' observable responses in everyday settings. This technique allowed the researcher to capture situational and spatial factors such as crowded versus less monitored areas that may shape compliance.
3. Document and artifact analysis
Relevant documents, including internal community regulations, meeting notes, and photographic records of signage, were analyzed. Prohibition signage itself was treated as a communicative artifact and examined as a "social text" whose meaning is produced through context and interaction.

Data analysis was conducted using thematic analysis, following an interpretive and inductive logic. The process involved data familiarization, initial coding, theme development, theme refinement, and interpretive synthesis. Thematic analysis is suitable for identifying patterned meanings across qualitative data while maintaining sensitivity to context and participant perspectives. This approach enabled the researcher to develop analytically coherent themes that explain how prohibition signage is symbolically understood and how such understandings relate to compliance behavior. The analytic process emphasized transparency and reflexivity, ensuring that interpretations were grounded in participants' accounts rather than researcher assumptions [24], [25].

The trustworthiness of the study was ensured through several strategies. Credibility was enhanced by triangulating interviews, observations, and documents. Transferability was supported through rich contextual descriptions of the research site and social setting. Dependability and confirmability were addressed by maintaining an audit trail of analytic decisions and reflective memos throughout the research process. Ethical considerations included informed consent, voluntary participation, anonymity of participants, and the use of data solely for academic purposes.

3. Results and Discussion Data

Results

The qualitative analysis revealed that prohibition signage in the Villa Kintamani residential area does not function as a uniform or self-explanatory regulatory instrument. Instead, signage is interpreted through ongoing social interaction, shared experience, and situational judgment. Residents' compliance with household waste management rules emerges from how signage is symbolically understood, rather than from the presence of visual prohibition alone. Four main themes were identified through thematic analysis, reflecting recurring patterns in residents' interpretations and practices. Field data indicate that many residents recognize prohibition signage as an environmental message but do not necessarily perceive it as a binding rule.

Signage is often interpreted as a visual reminder rather than a compulsory regulation with concrete consequences. Residents frequently described signage as something that is "seen every day" but gradually loses its authoritative force. When signage is not accompanied by explicit sanctions or consistent follow-up, its symbolic meaning weakens over time. Observational data further support this finding, showing that damaged or poorly maintained signage reinforces the perception that the rule is no longer actively upheld. This pattern suggests that signage alone does not automatically produce compliance. Instead, its effectiveness depends on whether residents interpret it as part of a meaningful normative order.

The second theme highlights the importance of perceived legitimacy behind prohibition signage. Residents tend to comply more readily when signage is believed to originate from collective agreement or active neighborhood governance rather than from anonymous or unclear sources. Signage perceived as representing a shared community decision is interpreted as a collective norm. In contrast, signage whose authorship or authority is unclear is often questioned or ignored. From the residents' perspective, the symbol gains strength when it is socially anchored in recognizable actors, such as neighborhood leaders or community meetings. This finding demonstrates that signage does not operate independently of social structure. Instead, it functions as a symbol of authority whose meaning depends on trust, recognition, and relational proximity.

The third theme reveals that compliance with prohibition signage is situational rather than consistent. Residents adjust their behavior depending on spatial and social conditions, particularly visibility and informal social monitoring. Observations show that areas close to guard posts, main roads, or frequently used communal spaces exhibit higher compliance levels. Conversely, locations that are less visible or rarely monitored tend to accumulate improperly disposed waste, even when signage is present. This pattern indicates that residents' actions are guided by expectations of social evaluation rather than by the textual content of the signage itself. Compliance becomes a situational response to perceived observation rather than a stable internalized norm.

The final theme emphasizes that the meaning of prohibition signage is not static but collectively negotiated through shared experiences. Residents who have previously participated in discussions, conflicts, or collective actions related to waste management tend to interpret signage more seriously. Such experiences transform signage from a passive object into a reminder of collective responsibility. In this sense, signage functions as a symbolic reference to past interactions, reinforcing compliance through social memory rather than visual persuasion alone. This finding underscores that signage gains meaning through its integration into community narratives and lived experience.

Table 1. Summary of Key Themes and Interpretive Meanings

Theme	Core Interpretation	Implication for Compliance
Weak normative symbol	Signage viewed as reminder, not obligation	Compliance is inconsistent
Legitimacy of authority	Meaning shaped by perceived source	Higher compliance when authority is trusted
Situational compliance	Behavior depends on visibility and monitoring	Compliance varies by location
Collective negotiation	Meaning formed through shared experience	Stronger internalization of norms

Source: Field data analysis (2026)

Table 1. Summary of Key Themes and Interpretive Meanings synthesizes the core findings of the field analysis by systematically linking residents’ interpretations of prohibition signage with their observable patterns of compliance in household waste management. The table functions as an integrative map that connects empirical themes to their practical implications, allowing the reader to grasp the overall logic of the findings in a concise yet analytically grounded manner. The first theme, “Weak normative symbol,” captures residents’ tendency to perceive prohibition signage primarily as a visual reminder rather than as a binding rule. Although the signage is recognized and cognitively understood, its symbolic force remains limited when it is not reinforced by sanctions, maintenance, or consistent follow-up. As reflected in the table, this interpretive meaning leads to inconsistent compliance, where adherence depends on individual discretion rather than shared obligation.

The second theme, “Legitimacy of authority,” highlights that the meaning of signage is strongly shaped by residents’ perceptions of who stands behind the message. When signage is interpreted as representing a trusted and socially recognized authority such as neighborhood leaders or collective agreements it gains normative weight. Conversely, when the source of authority is ambiguous, the sign loses credibility. The table shows that higher levels of compliance emerge when signage is associated with legitimate and familiar community actors. The third theme, “Situational compliance,” emphasizes that residents’ adherence to waste management rules varies across space and context. Compliance is higher in areas with greater visibility and informal social monitoring, and lower in less observed or peripheral locations. As summarized in the table, this results in spatially uneven compliance, demonstrating that behavior is guided by situational expectations rather than by the signage text alone.

The fourth theme, “Collective negotiation,” reflects how shared experiences such as past conflicts, discussions, or collective actions related to waste management shape the meaning of signage over time. In these cases, signage becomes a symbolic reference to collective responsibility rather than a mere instruction. The table indicates that this process leads to stronger internalization of norms, as compliance is motivated by social memory and community identity. Overall, Table 1 demonstrates that residents’ compliance with household waste management rules is not produced by prohibition signage in isolation, but by the symbolic meanings that residents collectively construct. The table clarifies how signage operates within a social and interpretive framework, reinforcing the study’s central argument that environmental communication is most effective when symbols are socially legitimized, situationally reinforced, and embedded in shared community experience.

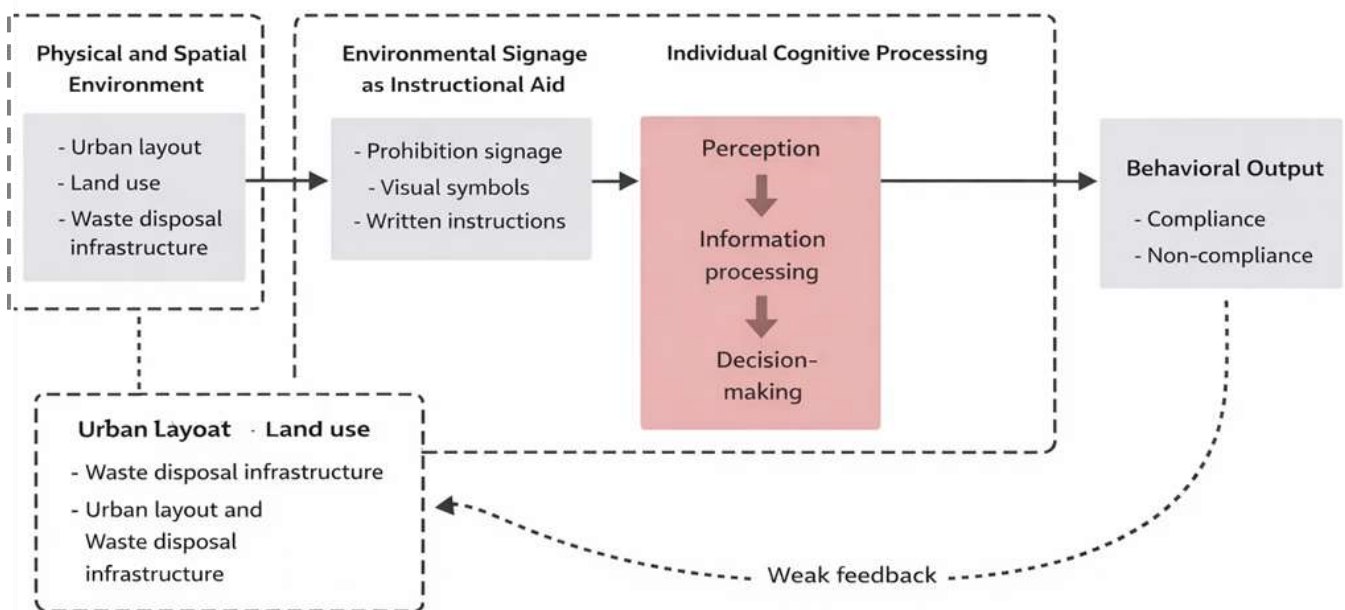
Discussion

This study set out to examine residents’ compliance with household waste management through the lens of symbolic interactionism, focusing on how prohibition signage functions as environmental communication symbols. The findings demonstrate that residents’ compliance cannot be adequately explained by linear, cognition-based models of signage effectiveness. To clarify this theoretical contribution, Figure 1 is presented as a contrast model that represents a dominant cognitive linear perspective commonly found in environmental psychology and wayfinding literature.

As illustrated in Figure 1, the cognitive linear model conceptualizes environmental signage as an instructional aid embedded within the physical and spatial environment. In this framework, signage is assumed to operate through a sequential process: residents perceive visual symbols, process the information cognitively, make a rational decision, and then display behavioral output in the form of compliance or non-compliance. The model presumes that meaning is largely objective and transferable, and that behavior is the outcome of individual cognitive processing.

Within this logic, contextual elements such as urban layout, land use, and waste disposal infrastructure function as background conditions that shape perception, while signage itself is treated as a neutral carrier of information. Feedback from behavior to the environment is depicted as weak, indicating that individual actions have limited influence on the symbolic structure of the communication system. Such a model implicitly assumes that improving signage clarity, visibility, or informational content will lead to improved compliance. While the cognitive linear model provides a useful baseline for understanding informational aspects of signage, the empirical findings from Villa Kintamani reveal several limitations of this approach. First, residents did not consistently interpret prohibition signage as binding instructions, even when the signage was visible and clearly worded.

Figure 1. Cognitive Linear Model of Environmental Signage and Behavioral Response



This challenges the assumption that perception and information processing alone are sufficient to explain compliance. Second, the contrast model does not account for legitimacy of social authority, which emerged as a central determinant of how signage was interpreted. In practice, residents assessed signage

not only based on its content, but also on whether it represented a collectively recognized authority, such as neighborhood leadership or shared community agreements. This evaluative process cannot be captured by a model that treats signage as an impersonal informational input.

Third, the cognitivelinear framework fails to explain the situational and contextual nature of compliance observed in the field. Residents' behavior varied significantly depending on visibility, social monitoring, and spatial context. Compliance was higher in socially exposed areas and weaker in peripheral or less monitored spaces, despite identical signage. These patterns suggest that compliance is shaped by expectations of social evaluation rather than by internal cognitive decision-making alone. In contrast to the cognitive linear model shown in Figure 1, the findings of this study support a symbolic interactionist explanation of environmental communication. From this perspective, signage is not merely an instructional tool but a social symbol whose meaning is continuously negotiated through interaction. Residents interpret signage by drawing on shared norms, past experiences, and collective memory, rather than by processing information in isolation. The weak feedback loop depicted in the contrast model is particularly significant. Field evidence indicates that residents' actions such as repeated non-compliance or collective discussions following waste-related conflicts actively reshape the meaning of signage over time. This suggests a strong feedback mechanism, where behavior feeds back into shared interpretations and redefines the symbolic power of signage. Such dynamics are absent in linear models but are central to symbolic interactionism.

By juxtaposing the contrast model with empirical findings, this study reframes environmental communication as a socially embedded process rather than a technical transmission of information. Compliance emerges not as a direct behavioral response to signage, but as the outcome of how residents define the situation: whether they perceive the signage as representing a shared norm, whether they anticipate social judgment, and whether past collective experiences give the symbol moral weight. This reframing has important implications for environmental governance. Policies that rely solely on signage improvements risk overlooking the social processes that give such symbols meaning. Without legitimacy, collective reinforcement, and contextual sensitivity, signage remains a weak normative cue, regardless of its design quality. The discussion highlights the theoretical contribution of this study by demonstrating the limits of cognitive linear models and advancing a symbolic interactionist understanding of environmental signage. Figure 1 serves not as an explanatory model of the findings, but as a theoretical counterpoint that clarifies why existing approaches are insufficient. Practically, the findings suggest that effective waste management communication must integrate signage with participatory processes, social dialogue, and visible collective commitment. Signage becomes effective when it is embedded within a living social system, rather than treated as a stand-alone informational device.

4. Conclusion

This study concludes that prohibition signage in household waste management functions primarily as a symbolic form of environmental communication, rather than as a purely instructional or regulatory device. Residents' compliance in the Villa Kintamani residential area does not emerge automatically from the presence or clarity of signage, but from the meanings socially attached to it through everyday interaction. The findings demonstrate that signage is variously interpreted as a weak normative symbol, a representation of social authority, a situational cue, or a reminder of collective experience. Compliance is more likely to occur when signage is perceived as embodying legitimate, collectively recognized norms and when it resonates with shared social memory, while signage that is viewed as an external or impersonal

control mechanism tends to generate inconsistent and situational adherence. From a theoretical perspective, this study contributes to environmental communication and development communication scholarship by challenging cognitive linear models that conceptualize signage as a neutral informational input leading directly to behavioral output. By applying a symbolic interactionist framework, the study shows that compliance is a socially produced outcome, shaped by legitimacy, contextual definition of situations, and ongoing negotiation of meaning within the community. Practically, the findings suggest that environmental policies relying on signage should be complemented by participatory communication, visible community involvement, and reinforcement of local norms to ensure that symbols carry shared meaning. Future research may extend this approach to other residential or cultural contexts to further explore how symbolic processes mediate environmental compliance across different forms of local governance and community organization.

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