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**Bridging Practice Theory and Behavioral Science:
Understanding Residential Psychological Mechanisms of
Recyclable Waste Sorting in Collective Housing**

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Name	Sex	Age	Seniority (years)	Sorter
Cheikh	M	29	4	Yes
Amina	F	42	10	Yes
Lohanah	F	24	0.6	Yes
Emilie	F	33	20	Yes
Colombe	F	26	15	Yes
Camille	F	32	5	Yes
Julien	M	22	1	Yes
Christophe	M	33	3	Yes
Fatou	F	50	15	Yes
Alice	F	33	4	Yes
Abena	F	51	35	Yes
Alain	M	82	25	Yes

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Leila	F	31	2	No
Michel	M	52	7	No
Mélanie	F	55	8	No
Gwen	F	45	24	No
Jamal	M	27	5	No
Antoine	M	26	3	No
Rami	M	30	2	No
Samir	M	30	1	No
Jacqueline	F	56	10	No
Géraldine	F	42	9	No

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Table 2. Elements of practices, associated mechanism, and potential intervention at the residential scale

Elements of recycling practices in collective housing	Associated mechanism situated in the residential context	Possible intervention at the residential scale
Residential materiality	Residential affordances	Strengthen affordances favorable to recycling, and reduce affordances favorable to alternative behaviors
	Residential emotions	Eliminate or replace signals that trigger fear and disgust
Residential meaning	Estimating residential norms	Help residents reconstruct recycling norms to give meaning to their effort
	Self-conscious residential emotions	Appropriately activate shame, guilt, and potentially pride associated with recycling
	Estimating residential tendency to disorder	Quickly remove traces left by other residents that show well-known rules have been broken
Residential competences	Knowing how to take waste out	Help households more effectively control their waste dispatch within the residence
	Knowing how to communicate	Intervene on neighbor relationship networks rather than directly on individuals
	Knowing how to restore order	Highlight residents' competences in serving the residence to foster a contagion of order

Purpose

Despite their environmental and economic importance, recycling performances remain low in collective housing. While public policies based on decontextualized psychological mechanisms have shown some effectiveness, they appear limited in the context of collective housing. In parallel, research on social practices shifts the focus toward household consumption routines but offers few actionable interventions. This study aims to contribute to a more integrative theory by examining how psychological mechanisms are triggered, inhibited, or shaped by collective housing and how they contribute to residential recycling practices.

Design/methodology/approach

Twenty-two semi-structured interviews were conducted with residents living in collective housing in Paris and the surrounding departments. Psychological mechanisms were explored in depth through the practice elements of materiality, meaning, and competences.

Findings

Affordances and emotions elicited by shared spaces profoundly shape sorting practices. Residents reconstruct local sorting and cooperation norms and experience self-conscious emotions such as shame, guilt, and pride. Competences extend beyond the household, influencing how residents navigate shared spaces, communicate with neighbors, and restore order within the residence.

Practical implications

The study provides a framework for field diagnostics and for designing context-based interventions that target the residence rather than individuals, focusing on material affordances, residential norms, and residential competences.

Originality/value

By bridging practice theory and behavioral science through critical realism, this study conceptualizes psychological processes as generative mechanisms situated in material, symbolic, and social contexts. It advances a systemic, intervention-oriented understanding of sustainable consumption at the residential scale.

1. Introduction

In public policies aimed at improving waste sorting, interventions have primarily focused on changing individual behaviors by influencing attitudes and information levels. These strategies are mainly grounded in the Attitude-Behavior-Choice (ABC) model, which gives secondary importance to context and does not sufficiently account for individuals' psychological priorities (Shove, 2010). This approach relies largely on decontextualized interventions and yields effects that are moderate and highly heterogeneous (Schultz, 2014; Mertens et al. 2021). By treating context primarily as an external constraint that opposes the expected behavior change, the ABC model does not sufficiently consider how waste sorting is deeply shaped by the symbolic, physical, and social environment.

Despite its importance for the economy and the environment, sorting performance remains low in collective housing (Knickmeyer, 2020). This type of housing hosts a growing share of Europe's urban population (Eurostat, 2023) and is a priority for many local authorities and waste-management agencies. Several variables that may help explain low performance have been identified, such as collective rather than individual bins, high population density, and greater distance to sorting points (Geiger et al., 2019; Knickmeyer, 2020). However, the mechanisms through which collective housing influences sorting behavior remain poorly understood (Geiger et al., 2019). Rather than merely an external factor that affects the probability of sorting, collective housing may profoundly shape the different aspects of households' sorting practices.

This field study also aims to contribute to research on consumption practices (Shove, 2012), within which waste sorting is an integral component (Dyen et al., 2018; Katan, 2022). Practice theories offer valuable insights into social dynamics by articulating material elements, meanings, and competences (Shove et al., 2012). However, despite their theoretical contribution to understanding the complexity and interconnections of consumption routines, these theories have not yet provided sufficient operational guidance to steer public policy (Sahakian and Wilhite, 2014 ; Watson et al. 2020) and therefore do not constitute an adequate alternative to the ABC model. Better understanding and improving sorting in collective housing requires keeping the critical insights of practice theory while proposing concrete levers through situated psychological mechanisms. In this perspective, we examine how fundamental psychological mechanisms are triggered and shaped by collective housing. Better understanding these contextualized mechanisms within a well-defined setting enriches theory and complements other approaches, such as surveys or experiments (Paluck and Shah, 2025).

Drawing on critical realism (Archer et al., 2013), this study seeks to clarify how social structures and generative mechanisms (real domain) give rise to situated practices (actual domain), which in turn produce observable responses (empirical domain). This stratified ontology of the real connects methods and levels of analysis rather than opposing them (Wynn and Williams, 2014). The analysis examines how sorting practices are shaped by the materiality, meanings, and competences associated with collective housing, through the identification of situated psychological mechanisms. The study is based on 22 interviews conducted in Paris and surrounding departments with residents living in collective housing. All participants share a recycling infrastructure and broadly similar service in this densely populated urban area, despite minor differences (Lemaire, 2020). Half of the interviewees sort their waste and the other half do not. Findings are organized around the core elements of practices materiality, meanings, and competences (Shove et al., 2012). The analysis identifies

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3 how various psychological mechanisms are enacted in the specific context of collective
4 housing and contribute to shaping sorting practices.
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6 These psychological mechanisms are activated, shaped, and transformed by the residential
7 context itself, playing a key role in structuring waste-sorting practices in collective housing.
8 Residential materiality is associated with specific affordances (Gibson, 1977) for example, a
9 bush that invites residents to throw waste out of the window as well as emotions (Ekman,
10 1992) specific to collective housing, such as fear of going to the garbage room. At the same
11 time, residents' search for meaning leads them to reconstruct residential norms (Fornara et al.,
12 2011), to assess the local tendency to cooperate (Keizer et al., 2008), and to experience moral
13 emotions associated with neighbors' sorting behavior for example, shame, guilt, and pride
14 (Tracy et al., 2007). Competences are not limited to managing waste within the household but
15 also include strategies for navigating shared spaces, creating or mobilizing a network of
16 neighbors, and restoring order within the residence. The residential mechanisms that
17 contribute to sorting practices thus provide both theoretical insights and practical
18 implications.
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23 Theoretically, this study offers a deeper understanding of sorting practices by examining how
24 psychological mechanisms manifest concretely within collective housing and shared spaces. It
25 aligns with a broader effort toward reconciliation (Breadsell et al., 2019) between the critical
26 insights of practice theory, which decenters individual analysis (Shove et al., 2012), and the
27 ABC model, which identifies specific, actionable mechanisms (Whitmarsh et al., 2011). This
28 articulation is essential for designing multi-level interventions that target social practices
29 through situated and interrelated psychological mechanisms, within an integrative and
30 systemic framework. The study also proposes actionable pathways for conducting field
31 diagnostics and subsequently intervening effectively in collective housing settings. Future
32 research could test the impact of this residence centered approach while interpreting the
33 results within the broader framework of residents' consumption practices and systemic change
34 (Keller et al., 2022).
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38 2. Literature Review

39 2.1. *Understanding individual psychological mechanisms* 40 *involved in sorting*

41 The literature on the determinants of waste sorting has identified numerous individual factors
42 that increase or decrease the likelihood of sorting. Most of these factors are organized within
43 theoretical frameworks, such as the Theory of Planned Behavior (Ajzen, 1991) or the Value-
44 Belief-Norm Theory (Stern, 2000). According to these theories, individuals are more likely to
45 sort waste if they believe that sorting is rewarding, socially accepted, easy to perform, useful,
46 and represents a moral obligation. While these studies are valuable for reconstructing how
47 individuals mentally represent waste sorting, psychological determinant approaches have
48 limitations in explaining actual behavior. In their meta-analysis of 91 studies, Geiger et al.
49 (2019) statistically demonstrated that individual-centered factors explain sorting intentions
50 better than actual behaviors. Yet it is behaviors, rather than intentions, that influence the
51 performance targets of waste management organizations.
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58 Conversely, contextual factors may have a greater impact on behaviors. Research in waste
59 management has identified several key contextual factors, including housing type, the quality
60 of infrastructure, and the effectiveness of collection services (Timlett & Williams, 2011). In

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3 their meta-analysis of interventions aimed at improving household sorting, Varotto and
4 Spagnolli (2017) showed that environmental alteration and social modeling are the two most
5 effective interventions. For example, directly modifying the appearance of a bin with floral
6 stickers (Lin et al., 2016) or asking neighbors to explain how to sort (Burn, 1991) improves
7 household sorting. However, results remain heterogeneous and show only moderate
8 effectiveness (Varotto & Spagnolli, 2017). Such interventions may not be sufficient in more
9 challenging contexts, such as collective housing.
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12 To improve sorting in collective housing, a better understanding of the effects of the
13 residential context is needed. Unlike individual factors, contextual factors are not clearly
14 organized into theories. Context is generally considered either as a background variable
15 shaping beliefs about sorting or as a factor that facilitates or hinders action (Fishbein & Ajzen,
16 2011). Context can also be seen as a set of variables that are difficult to articulate, influencing
17 pro-environmental behaviors without clearly identifiable underlying mechanisms (Stern,
18 2000). Other fundamental psychological mechanisms, still underexplored, may also help
19 deepen understanding of how collective housing influences individuals' daily decisions.
20 These mechanisms stem from recent developments in psychology that pay increasing
21 attention to the role of context in shaping emotions, social norms, and behavior (Kahneman,
22 2011). Better understanding these mechanisms would help shift the analytical focus and
23 model sorting practices beyond individual behaviors.
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29 *2.2. Decentering the Analysis: The Role of Social* 30 *Practices in Waste Sorting* 31 32

33 Despite their contributions, the use of individual psychological models in public policies has
34 been subject to criticism. In a conceptual paper, Shove (2010) criticizes the overly exclusive
35 reliance on the Attitude-Behavior-Choice (ABC) model to address climate challenges. This
36 model would be based on an individualist ideology, intended to correct residents' behaviors
37 by reducing the barriers to adoption. The ABC model also tends to overlook the role of social
38 dynamics and spatio-temporal configurations, focusing too narrowly on the citizen-as-
39 consumer. In this context, research on social practices offers both a radical and actionable
40 alternative for achieving more systemic change. Rather than aiming to change individual
41 sorting behaviors, the goal would be to transform constellations of interconnected social
42 practices (Shove, 2010).
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45 In the context of waste sorting, practice theories help to better understand sorting as part of
46 broader consumption routines (Warde, 2014). The core elements, materiality, competence,
47 and meaning, enable a description of practices and how they are interconnected with other
48 practices (Shove et al., 2012). Although no fully consensual definition exists, a practice can
49 be defined as a stabilized configuration of interconnected elements: bodily and mental
50 activities, objects and their uses, and practical know-how (Reckwitz, 2002). From this
51 perspective, sorting food waste is not an end in itself but is embedded in a more complex
52 sequence of shopping, cooking dinner, and cleaning up (Dyen et al., 2018). The discomfort
53 experienced during sorting cannot be explained solely by objective barriers but also by a
54 misalignment between negotiable secondary practices (sorting) and primary, psychologically
55 prioritized practices (cooking) (Katan, 2022). From the citizen's perspective, sorting appears
56 as an optional and negotiable addition. Sorting can also be interpreted as an issue of local
57 governance and bodily control (Glad, 2018) or as a practice that neglects the specific
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3 challenges faced by immigrant populations (Hellwig et al., 2019). Practice theories thus help
4 shift the analytical focus toward citizens' psychological priorities within their consumption
5 practices.
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8 Despite its theoretical contributions, the practice-based approach is not sufficiently
9 operational to constitute a viable alternative capable of influencing public policy (Watson et
10 al., 2020). Beyond its complexity, its findings are difficult to translate into action because of a
11 radical disconnect from psychological research. In a commentary responding to Shove et al.
12 (2010), Whitmarsh et al. (2011) argue that an exclusive focus on social structures and a
13 neglect of the individual risks denying citizens' agency and excluding them from transition
14 processes. Rather than opposing two irreconcilable paradigms, as different as "chalk and
15 cheese" (Shove, 2010), it is necessary to leverage psychological research within a
16 multidisciplinary perspective. A critique that is too radical also makes it impossible to
17 develop a more integrative theory that connects different levels of analysis. Beyond the ABC
18 model, recent psychological research has increasingly focused on the role of context and may
19 help renew studies and interventions related to waste sorting in collective housing.
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24 *2.3. Decentering the analysis while activating situated* 25 *psychological mechanisms: the natural laboratory of collective* 26 *housing* 27 28

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30 To reconcile "chalk and cheese" and improve waste sorting, particularly in collective housing,
31 critical realism offers a robust epistemological framework for articulating social structures,
32 situated practices, and psychological processes. Drawing on the stratified ontology of reality
33 (Archer et al., 2013), three levels can be distinguished: (1) the real, comprising structures or
34 cognitive generative mechanisms; (2) the actual, where these mechanisms combine into
35 stabilized practices within specific contexts; and (3) the empirical, where these practices
36 manifest as observable responses. From this perspective, psychological processes become
37 active components of the causal mechanisms underlying social practices. The ABC
38 framework can serve as an analytical reference to identify how individual-level cognitive,
39 affective, and behavioral responses emerge from, and interact with, contextually grounded
40 mechanisms. This integration specifies how residential materiality and meanings, along with
41 residents' situated competences, translate into cognitive, affective, and behavioral responses.
42 Critical realism makes it possible to integrate psychology without reducing the social to the
43 individual. A methodological pluralism (including interviews, surveys, ethnography, and
44 experiments) becomes necessary to grasp a stratified, open, and causally complex reality
45 (Wynn & Williams, 2012).
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50 Collective housing can be considered a strategic setting for reconstructing how general
51 generative mechanisms concretely manifest within residential sorting practices. While
52 psychological mechanisms related to sorting are usually studied in abstract, decontextualized
53 ways (e.g., surveys or laboratory experiments), examining them in real-life contexts provides
54 a better theoretical understanding of how the context triggers, modulates, or inhibits these
55 mechanisms (Paluck and Shah, 2025). Several of these mechanisms have not yet been
56 sufficiently explored within their residential context. The residence contains material elements
57 that may activate specific affordances (Gibson, 1977) or fundamental emotions (Ekman,
58 1992). Beyond a simple stimulus-response model, the residence is also interpreted by
59 inhabitants to attribute situated meaning to the act of sorting. Local norms (Fornara et al.,
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2011), self-conscious emotions (Tracy et al., 2007), and cues of disorder (Keizer et al., 2008) have never been studied in depth within their residential context. In addition to materiality and meaning, sorting should also be approached as a situated competence. Although research on consumption routines (Dyen et al., 2018; Katan, 2022) and consumer logistics (Monnot et al., 2014) address these aspects, the competences specifically mobilized in collective housing remain insufficiently understood.

This research thus seeks to explore how psychological mechanisms related to recyclable waste sorting, and still underexplored, are triggered and modulated through residential elements of materiality, meaning, and competence.

3. Method

3.1. *Fieldwork and participants*

To better understand the influence of collective housing on sorting practices, 22 in-home interviews were conducted in Paris and the four surrounding departments. This region (Paris and the “Petite Couronne”) is an urban area with a very high average population density of approximately 9,000 inhabitants per km² (INSEE, 2025). This region also has lower-than-average sorting performance compared to the national average (Lemaire, 2020). Only individuals living in collective housing were interviewed. In addition to housing type, participants had to be French-speaking, over 18 years old, and have access to a sorting area in their residence. Table 1 presents the characteristics of the respondents. Recruitment was carried out through door-to-door campaigns in selected neighborhoods representing a diversity of socio-economic profiles. The main sampling criterion was sorting behavior. Among the 22 respondents, 12 sort their waste, while 10 do not. A respondent was classified as a non-sorter if they reported not sorting and did not have a dedicated storage space for recyclable materials at home. In this article, the term 'waste' primarily refers to everyday waste that is potentially recyclable. Someone who occasionally sorts (e.g., delivery boxes) but does not have a dedicated storage space was not considered a sorter in this study. The sampling process was concluded once saturation was reached.

All residents in this region follow the same sorting guidelines and color codes. The yellow bin or container is for loose paper, cardboard, metals, and plastic packaging. The brown bin or container is for garbage bags containing non-recyclable household waste, such as food scraps and soiled packaging. Glass is collected separately in public containers. While the collection frequency, associated days, and information distributed to residents vary slightly across municipalities, they remain broadly consistent throughout the study area (Lemaire, 2020). The sample is diverse in terms of age, length of residence, gender, and housing type (social housing or private co-ownership). Social housing is characterized by lower rents, lower income levels, a higher proportion of tenants, and the frequent presence of a building caretaker.

3.2. *Data collection and analysis*

To explore our research proposal, we conducted semi-structured interviews using an interview guide organized around various themes drawn from the literature review (e.g., emotions, action temptations, residential norms) and aimed at better understanding how psychological mechanisms unfold in collective housing. The interviews began with an open-ended question such as: “Tell me about how you manage your everyday waste.” Probing questions were used to encourage participants to elaborate on their responses (e.g., “Could you tell me more about

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3 X?”). Only in the second part of the interview were topics addressed that had not been
4 spontaneously mentioned. The interviews lasted an average of 40 minutes. They were audio-
5 recorded with participants’ consent and fully transcribed. Data analysis was conducted using
6 Nvivo software (version 1.7.1). An initial coding process aimed to categorize content based
7 on the dimensions of a practice (Shove et al., 2012): materiality, meanings, and competences.
8 A second coding process sought to identify situated psychological mechanisms,
9 underexplored in relation to sorting, and how they concretely manifest in collective housing
10 contexts.
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13 This strategy aligns with the philosophy of critical realism (Archer, 2013), which posits that
14 generative mechanisms (e.g., social structures, cognitive mechanisms) may or may not
15 manifest through social practices, which can then be empirically studied as observable
16 responses. From this perspective, observations identified in the transcripts (empirical level)
17 originate from underlying real mechanisms that are not directly observable (fundamental
18 mechanisms, residential structures). Practices thus constitute an intermediate level (the actual)
19 that enables or constrains sorting behaviors. These elements (materiality, meanings,
20 competences) serve as concrete channels through which generative mechanisms become
21 situated and enacted, providing analytical leverage to trace how abstract mechanisms are
22 instantiated in practice. The objective is to deepen the understanding of the psychological
23 processes underlying variations in sorting behaviors within their residential context. This
24 analytical approach offers a structured way to connect domestic practices with fundamental
25 psychological mechanisms, without reducing social complexity to individual factors.
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30 4. Results: Recyclable waste sorting as a situated 31 practice in collective housing 32 33

34 In order to move beyond an analysis centered on the individual or the household, we analyze
35 waste sorting as a situated practice within collective housing. We use the three core
36 components of social practice theory, materiality, competence, and meaning (Shove et al.
37 2012), as a guiding framework to explore how different psychological mechanisms are
38 triggered and reconfigured within the residential context of collective housing. This analysis
39 aims to contribute to a better understanding of waste sorting in collective housing at the
40 intersection of individual behaviors and social practices.
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43 4.1 Residential materiality and waste sorting 44

45 *Sorting infrastructure and residential affordances*

46 *Provision of bins and shared accessibility.* The sorting infrastructure is not merely one factor
47 among others influencing individual sorting behavior. The arrival of a sorting station makes
48 the behavior possible, as Amina, a 42-year-old woman, explains: “*As soon as the recycling*
49 *bin arrived, we started.*” The number and volume of bins are also crucial. While Abena began
50 sorting as soon as the bins were installed, Gwen stopped sorting due to an insufficient number
51 of bins. Gwen, a 45-year-old woman living in a public housing estate, frequently finds herself
52 facing an already full bin. She observes that the bins are not the right size: “*The problem is*
53 *that for sorting, we have a 240-liter bin or a 330-liter bin. That’s the size they usually give for*
54 *a family of four or five in a house. The problem is there are dozens of households here.*” A
55 former recycling ambassador and a firm believer in the importance of sorting, Gwen
56 nonetheless gave up sorting her waste because “*here, it’s just badly organized.*” Her decision
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3 to stop sorting highlights the absence of immediately accessible action opportunities in the
4 residential environment.
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6 *The ergonomics of the sorting station.* Beyond provision, the ergonomics of sorting stations
7 encourages certain actions over others. Amina observes: “*Sometimes the bin is too small to fit*
8 *the cardboard; you have to tear it up*”. Her residence is equipped with underground
9 containers, with a small flap that needs to be lifted to dispose of recyclables. Both the
10 underground containers and the bins may force residents to dispose of waste item by item, as
11 Cheikh explains: “*The bins... you can’t open them fully; there’s a small opening, a small*
12 *rectangle, to stop people from throwing in anything and everything*”. Despite this constraint,
13 Cheikh sorts his waste every day because “*it’s everyone’s responsibility*.” These findings
14 show that when the materiality of the residence does not encourage sorting, an additional
15 motivation is required to compensate.
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19 *The characteristics of the home strongly constrain how individuals manage their waste.*
20 Jacqueline, a 50-year-old woman, does not sort waste at home. To start sorting, she would
21 need a clear storage space inside her apartment: “*I wish we had several bins indoors, small*
22 *bins with colors; it would be more fun and easier*”. Gwen lives in a narrow kitchen that makes
23 it difficult to install multiple bins. Despite having an accessible balcony, Gwen does not use it
24 for sorting because “*in daily life, it’s just not practical*”. The location of the home can also
25 facilitate competing behaviors, as Michel observes: “*Here, people throw more things out the*
26 *window because the kitchens overlook a pile of bushes*.” More than just another factor, the
27 home profoundly shapes sorting by offering action opportunities that can either encourage or
28 discourage sorting behaviors.
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32 *Residential affordances: a contextualized general mechanism.* The situated descriptions
33 provided by residents allow us to identify broader psychological mechanisms while
34 specifically contextualizing the notion of affordance within residential materiality. Our
35 analysis reveals that the provision of sorting bins, the ergonomics of sorting stations, and the
36 characteristics of the home are not merely factors among others but intimately shape
37 behaviors by inviting certain actions over others. While several studies have emphasized the
38 importance of domestic configurations in daily routines (Pink, 2012; Warde, 2014), the notion
39 of affordance here enables a direct link between the details of residential materiality (for
40 example, the presence of a bush) and concrete action temptations (for example, getting rid of
41 waste). Affordances refer to the action opportunities offered by the environment. According
42 to the theory of direct perception (Gibson, 1977), perception and action are closely
43 intertwined: individuals quickly and automatically perceive the actions their environment
44 affords them. At the residential level, the home and common areas thus provide concrete
45 affordances that may invite residents to sort their waste or, conversely, to engage in
46 competing behaviors (for example, throwing everything in the same bin or throwing waste out
47 the window). Sorting is therefore not merely influenced by an external context but is directly
48 enabled or constrained by the environment itself. The theory of affordances here provides a
49 reading directly oriented toward action and the transformation of the residential environment,
50 thereby making approaches inspired by Bourdieu (1990), Merleau-Ponty (1976), or Nicolini
51 (2012) more operational. In this study, the concept of affordance is thus empirically grounded
52 and contextualized at the residential scale, showing how specific material arrangements shape
53 waste sorting practices.
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Residential cues and situated emotional reactions

Residential disgust. The residence is also composed of signals that trigger shared emotional reactions. Residential waste areas generate disgust, as Cheikh explains: “When you see places where the bins are not put away, it’s not clean, people won’t bother going into the garbage room to sort because there are rats and mice. But when it’s well maintained, cleaned, and the bins are well arranged, it encourages you, it’s not the same thing”. The lack of ventilation is also problematic, as Alain explains: “There are odors when the ventilation system is broken”. For Christophe, the absence of sorting changes the appearance of the residence and generates disgust: “Some people use big garbage bags and end up leaving them next to the bins even if it means it’s disgusting”. In addition to bags left outside the bins, items thrown out of windows also provoke disgust, as Gwen describes: “People throw cigarette butts and even diapers out the window. I get them on my terrace”. Waste management is thus an integral part of residential materiality and triggers a strong shared reaction of disgust.

Residential fear. Garbage rooms or the path leading to them can also provoke fear. Beyond rats, poor lighting is a key factor. Samir explains that his partner does not sort waste in their residence because: “The only way to sort is to go down two or three floors. Plus, it’s a really creepy place, and my girlfriend is scared to go there. Most of the time there isn’t enough light”. In lower-income neighborhoods, insecurity is also an important factor. Abena, a 51-year-old woman who has lived in the residence for 35 years, recalls that she did not sort waste a few years ago: “At the time, there were a lot of drug trafficking problems in the basements, and the police came often. I used to drop off my trash a bit further away, in another building, but I didn’t sort”. The garbage room or the path to reach it can thus trigger both bodily and cognitive reactions of fear, leading to apprehension and avoidance behaviors.

Fundamental residential emotions. The analysis shows that certain residential stimuli trigger bodily reactions of disgust or fear, which directly influence sorting. Unlike the notion of anticipated affect, dominant in the literature on sorting determinants and centered on the individual’s cognitive evaluation (Geiger et al., 2019), fear and disgust here are triggered by the materiality of the residence (odors, lighting, sounds) shared by all residents. These shared emotions lead to the avoidance of behaviors required for sorting (for example, spending extra time in the garbage room) and are not addressed in research centered on practices. These specific emotions belong to a broader set. According to Ekman (1992), there are six universal emotions expressed and recognized across all cultures, which also include joy, surprise, anger, and sadness. These emotions are not just cognitive evaluations but are linked to automatic bodily reactions associated with approach or avoidance behaviors. By identifying residential triggers and emotions, we provide a more operational definition of how the body directly shapes practices through repeated interactions with material environments (Sahakian and Wilhite, 2014 ; Wallenborn & Wilhite, 2014). Disgust and fear are bodily reactions elicited by residential material conditions. This opens up new possibilities for field diagnostics and interventions.

4.2. Residential meanings and waste sorting

Emerging residential norms

The difficulty of knowing what neighbors do and think about sorting. Residents report difficulties in reconstructing their neighbors’ expectations and behaviors regarding sorting. As Alice, a 33-year-old woman, explains: “I never see my neighbors in the garbage room, and I

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3 *don't know if they sort*". This low visibility is not always compensated for by conversations
4 between neighbors, as Jacqueline explains: "*I see my neighbors' faces but we don't really*
5 *talk, everyone keeps to themselves. So regarding sorting, I don't know*". Even when
6 conversations are more frequent, sorting is not considered a socially acceptable topic of
7 discussion. Alain puts it this way: "*You're not going to ask 'Hi, how are you, so do you*
8 *sort?'*". Several strategies are therefore used to try to better understand other residents'
9 behaviors and expectations regarding sorting.
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12 *Strategies for reconstructing sorting norms.* Several signs are interpreted to actively make
13 sense of sorting behavior in collective housing. Even if residents rarely see a neighbor sorting,
14 they observe the quality of sorting in the recycling bins. This is the case for Samir: "*When I*
15 *see the bins are completely full in any way, I tell myself that people don't really care*". When
16 the bins do not allow easy inspection of their contents (e.g., small slots, underground
17 containers), another strategy is to estimate how quickly the regular garbage bins fill up, as
18 Cheikh explains: "*For the regular bins, already, they fill up really fast, whereas normally I*
19 *think if we sorted, it would balance things out*". Other cleanliness-related behaviors are also
20 used to actively infer the importance of sorting in the residence. Gwen observes: "*When*
21 *people leave their bags next to the dumpster, or throw everything in any way, you know*
22 *they're not sorting*". Beyond visual observations, certain sounds are also used to estimate
23 local norms. Samir, who only sorts glass, recalls that even as a child "*You would often hear, in*
24 *the middle of the neighborhood, the sound of breaking glass*". Residents thus make an active
25 effort to make sense of sorting in collective housing by trying to reconstruct what is
26 considered normal in the residence. People do not sort only 'for the planet' only, but also to
27 contribute to a collective residential effort.
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32 *The emergence of residential norms.* Residents make an effort to better understand to what
33 extent sorting is truly normal and expected within the residence. This analysis aligns with the
34 research program of Cialdini and Jacobson (2021), which argues for a better understanding of
35 how individuals estimate social norms in different contexts. These results also complement
36 work on local norms (Fornara et al., 2021) by specifically focusing on residential norms in
37 collective housing. This effort to reconstruct residential norms reveals the process of
38 interpretation and meaning-making within the shared residential space. New communications
39 about residential social norms are needed to help residents perceive sorting as a normal and
40 locally expected behavior.
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42 ***Moral reflections and emotions about sorting in the residence***

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44 *The absence of sorting: a form of residential disengagement.* The lack of waste sorting is
45 interpreted as a sign of neighbors' disengagement from the residential community. Camille
46 expresses it as follows: "*It's a mark of respect... I find it harsh when the bins are totally*
47 *disregarded. I think 'Ok, you're in a very individualistic mindset, you don't care about*
48 *others'*". For her, sorting represents an awareness that we are part of a community of
49 residents: "*If you feel that people care about sorting, it means they care about how we live*
50 *together in society, and potentially, that they care about their neighbors*". Conversely,
51 respecting sorting guidelines would encourage Camille to interact more with neighbors and to
52 get involved in the residence: "*I'd feel more comfortable initiating things*". The traces left by
53 others regarding sorting are not neutral but trigger moral reflection.
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57 *Shame, guilt, and pride associated with residential sorting.* Residents mention several social
58 emotions. Visible waste and lack of cleanliness generate shame. For Michel, "*It's so dirty*
59 *here during the weekends, I'm ashamed to invite my family*". This shame can also be
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3 anticipated when neighbors are present to observe simple gestures, as Rami explains: “*When*
4 *you’ve eaten your triangle sandwich or you’re throwing away your Amazon packaging... then*
5 *for sure if you throw that in the general bins in front of someone, you really have no excuse,*
6 *morally or towards the person. Then you instinctively sort*”. For Michel, the sense of being
7 watched encourages sorting to preserve one’s reputation: “*Sometimes neighbors watch your*
8 *actions, so when you go down to throw something in the trash, there’s always someone who*
9 *sees you, who sees whether you threw it in the right bin or did it wrong or threw it on the*
10 *ground*”. While shame implies the gaze of others, guilt is more self-centered. Not sorting
11 generates guilt for Antoine, 26: “*When you go down and see your neighbor doing the right*
12 *thing and you don’t, at some point, you start feeling a bit guilty. You tell yourself deep down,*
13 *well yeah, if everyone’s making an effort, why not me?*”. A form of pride could also emerge at
14 the collective level, as Antoine again explains: “*I’d be proud to sort if I felt what we had*
15 *achieved, all of us in the residence*”. However, individual sorting is not enough to generate
16 pride. Rami states: “*I’m not going to smile just because I throw away cardboard*”. Sorting in
17 the residence thus elicits moral and reflexive emotions.
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22 *Situated self-conscious emotions.* These accounts show that self-conscious emotions (Tracy et
23 al., 2007) such as shame, guilt, and pride are not merely stable, individual, and
24 decontextualized but are also triggered and modulated by the residential context. Sorting in
25 the residence is subject to reflexive interpretations that involve actively comparing oneself to
26 other neighbors. Unsorted waste, neighbors’ attention, or their effort feed a moral reflexivity
27 about sorting. Beyond practical aspects, new interventions are possible at the residential scale
28 to carefully activate shame, pride, and guilt.
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31 *Perceiving disorder as a social signal and the interplay between social* 32 *norms*

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34 *Waste management as a sign of disorder.* Poor waste management is also perceived as a sign
35 of disorder. Gwen, for example, describes how, due to young people hanging out in the lobby
36 at night: “*In the morning, in the lobby, you had to step over cigarette butts, spit, and cans. But*
37 *now it’s calmed down, they’ve grown up, they’ve moved on with their lives*”. This rule-
38 breaking affects the motivation to sort, as Samir explains: “*When you live in a place where*
39 *people throw things on the ground, over time it’s hard to keep thinking, okay, I’ll sort*”.
40 Official rules about bulky waste are also frequently broken. Gwen explains: “*I don’t*
41 *necessarily respect the days, I don’t always bring them all the way to the truck [...] So that’s*
42 *the kind of thing I don’t necessarily follow.*” In addition to abandoned waste and bulky items,
43 throwing things out the window is a major sign of disorder. Michel recounts: “*I’ve already*
44 *had a glass bottle fall onto my balcony*”. Gwen also reports what she herself describes as a
45 lack of civility: “*When you see someone throwing a frying pan or razors out the window, you*
46 *know there’s a problem*”. Waste thus signals a broader tendency not to cooperate in the
47 residence and to disregard the constraints necessary for collective living.
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52 *Residential incivilities as signs of disorder.* Beyond waste, other incivilities are also reported.
53 In her social housing residence, Gwen describes: “*There were guys doing mechanics in the*
54 *basement at midnight, they’d start their motorbikes, and it felt like they were riding through*
55 *your living room*”. The disturbances fluctuate over time and are not stable: “*There was a time*
56 *when yeah, I’d hear noise under the windows until really late and it was annoying*”. In
57 addition to noise, drug dealing points attract gatherings and people from outside the residence.
58 Cheikh observes that a place can quickly generate residential disorder: “*Sometimes young*
59 *people will come because they see the residence is quite clean, there are spots where you can*
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3 *hang out without a problem, the police won't come in because there are two entrances, an*
4 *entry and an exit, so often it can become a spot for dealing". Without intervention, the*
5 *residence becomes a transit zone for many outsiders. The boundary between the residence and*
6 *the outside world is also crossed in the sorting areas, as Cheikh notes: "There are people from*
7 *the suburban houses who come to dump their trash here because they say it's more*
8 *convenient for them". These behaviors can quickly fuel a spiral of disorder.*
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11 *The disorder spiral and inhibition between residential norms.* Residents' observations show
12 that poor waste management and incivilities carry a shared meaning within the residence and
13 can fuel a tendency toward disorder. The presence of signs of disorder sends a message that
14 "here, I don't have to follow the rules". In their study, Keizer et al. (2008) showed that
15 breaking one rule (e.g., not doing graffiti) increases the likelihood of breaking a different rule
16 (e.g., not littering). The transgression of one rule inhibits compliance with another, thereby
17 spreading disorder. While norms are typically studied independently and in isolation, our
18 results show how transgressions of residential rules (e.g., throwing things out of windows,
19 noise) could spill over and affect waste sorting behavior.
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22 23 **4.3 Residential competences and waste sorting**

24 ***Taking waste out: a situated residential competence***

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26 *Taking waste out: household adaptations to residential constraints.* Taking out recyclable
27 materials requires organizing in a way that fits shared residential spaces. To sort properly,
28 Cheikh makes the effort to stay informed: "I check the collection calendar. That way I know
29 which day to take down the bins. And I think some people don't know". Camille integrates
30 waste disposal into other trips and often forgets: "Since I'm on the fifth floor, I rarely go down
31 just for that. But obviously I forget often, so I have to put the bag in front of the door to
32 remember. But since my bin stinks, I don't want to do it too early... So I often end up thinking
33 'damn, I need to take out the trash' but making three or four trips before I remember". When
34 the number of bins is insufficient, sorting requires going further, as Gwen explains: "You sort
35 everything and then you find the bin is full. So you have to cross over hoping there's still
36 space on the other side". Throwing waste out the window might also be seen as a shortcut to
37 the sorting gesture. Speaking of her neighbor upstairs who throws things, Gwen notes: "She
38 was pretty overwhelmed, single with a large family. She couldn't be bothered going down and
39 threw a lot out the windows". The time it takes to dispatch waste is also anticipated by those
40 who don't yet sort. This is the case for Fatou, a mother: "The bins aren't far, and if we sort,
41 it'll just mean throwing things away at the same time as the trash". Taking waste out
42 therefore requires competences to adapt to residential constraints.
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48 *Taking waste out: a subcontracted task.* Sorting is not just an individual behavior and can
49 involve a division of tasks. The person separating waste at home is not necessarily the one
50 taking it to the sorting station. Children, in particular, often take out the bins. Michel explains
51 that in his residence: "It's often the kids who take down big bags and leave them on the
52 ground; the sorting bins are also often too high, so the kids just dump them". Children's
53 contribution to sorting can be educational but needs supervision, according to Cheikh:
54 "Sometimes I ask my daughter to take down the trash. You turn your head, and she'll put it in
55 the wrong bin... But I usually encourage the kids to do the plastics. Before going to work,
56 when the bag is full, we put it by the door so whoever goes out takes it down". In addition to
57 children, cleaning staff often dispatch waste for residents (e.g., elderly people). This
58 outsourcing can lead to losing control over the final step of sorting and may pose access
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3 issues to sorting bins. Emilie observes: “*All the cleaning ladies who come here put everything*
4 *in the same place, in the trash room, because you need a key to access the sorting room*”. The
5 sorting routine is thus not strictly individual but distributed across several actors within the
6 residential context.
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9 *Logistical strategies: a situated residential competence.* These accounts show that residents
10 adapt to the residential context based on their constraints and that this competence sometimes
11 involves coordinating several people. These observations extend work on consumer logistics
12 (Pieters, 1991; Monnot et al., 2014) by focusing on waste dispatching in collective housing
13 and through shared residential spaces. Consumer logistics looks at how consumers manage
14 goods, acquire, transport, and store them. This perspective also builds on research framing
15 sorting within consumption routines (Dyen et al., 2018; Katan, 2022), by detailing here how
16 residents concretely organize to dispatch waste in collective housing. New interventions
17 focused on residential logistics skills become possible.
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20 21 *Communicating about sorting: the promising role of social ties in* 22 *residential settings* 23

24 *Communicating about sorting among neighbors holds an underexplored potential.* Some
25 residents communicate about sorting through images or written messages. Cheikh describes
26 his personal initiative and the note he posted in a building hallway: “*As a reminder, this bin is*
27 *not for cans, it’s not a bin for coffee, it’s a paper bin*”. Camille also recounts leaving a note,
28 albeit with some reluctance: “*I didn’t even sign it personally, I just put ‘a concerned*
29 *neighbor’ because I didn’t want to put my name*”. Due to a lack of sufficient interactions with
30 neighbors, Camille didn’t want to come across as a killjoy. She adds, “*Maybe by building a*
31 *bit of connection, maybe we could ask each other questions, maybe there are people in the*
32 *building who really struggle with this sorting thing, and since we don’t have a chance to talk*
33 *about it, I’d ask a neighbor ‘by the way, I don’t get it, which bin is it?’ . But those kinds of*
34 *conversations aren’t possible right now*”. Some personalities are more daring, as Patricia
35 explains about a neighbor who sorts: “*One time, I had a bottle in my hand and I was about to*
36 *put it in the general waste bin. And there was a lady who called out to me, ‘no no madam,’ so*
37 *I followed what she said. I used to put cardboard in the general bin and she told me no no*
38 *cardboard goes there. I didn’t feel offended, I followed and I said thank you*”. Knowing how
39 to communicate about sorting is both crucial and still underutilized for spreading sorting
40 practices within a residence.
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45 *Communication with actors beyond the residents is also important.* Residents interact with
46 other stakeholders in the residential environment, which greatly impacts sorting practices.
47 Rami does not sort in France but used to sort in Japan because “*There, the concierges are kind*
48 *of gossip. They’ll even check how you dispose of your garbage. If you do it wrong and you’re*
49 *a bad student, they’ll let you know. They’d say, I looked in your bag, it was transparent, I saw*
50 *there was cardboard in it*”. The concierge also elicits empathy for Alice, who makes an extra
51 effort when the bin is full because “*you don’t want to leave it next to the bin because that*
52 *wouldn’t be fair to the concierge*”. For Cheikh too, “*the building superintendent plays a key*
53 *role as an interface*” between residents and the social landlord. Beyond the building
54 superintendent, residents sometimes communicate with other actors, such as city services.
55 Gwen states, “*I’m going to have to call because I’ve seen it several times, the recycling has*
56 *already been picked up two or three times by the trash collectors and dumped into the general*
57 *waste bin. So now I’m thinking wait, if the bin is really contaminated I get it, but I’ve seen*
58 *times when the bin wasn’t that polluted and it still went into the general waste*”.
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3 Communication skills around sorting therefore involve more than just neighbors (e.g.,
4 residential caretaker, city services).
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7 *Residential social ties within a multi-stakeholder approach.* Residents' observations show
8 that communication about sorting is an important skill for spreading sorting practices.
9 Strengthening ties between neighbors could increase informal communication about sorting
10 (notes, discussions). From a multi-stakeholder perspective, strengthening relationships
11 between residents, residential caretaker, and city services could improve the quality of waste
12 management services. These findings highlight the potential of social network theory
13 (Borgatti et al., 2018) to describe neighbor relations and individuals' positions within these
14 networks. Relationship networks form a new unit of analysis and intervention (Valente, 2012)
15 that helps to understand how the distribution of behaviors evolves within the residence.
16 Certain residents and other stakeholders thus possess key competencies for shaping and
17 promoting residential sorting practices.
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20 21 *Restoring residential order: a lever to reinforce sorting norms* 22

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24 *Individual initiatives to restore order.* Several individual initiatives aim to restore residential
25 order more broadly, without directly or explicitly communicating about sorting. Amina
26 describes how she tidies up waste left by a neighbor: “*I see a neighbor with big containers,*
27 *but he leaves the bag in front of the bin. Then I pick it up and put it inside. Because it brings*
28 *insects and creates bad smells*”. She also observes that retirees take care of the residence:
29 “*The old people, they're very tidy and they keep cleaning, trimming the trees, keeping*
30 *everything neat*”. Other cooperative behaviors may come from people who also break some
31 residential rules. Gwen explains: “*There was a guy in the building, he was dealing*
32 *downstairs, whistling every two minutes, it was really annoying, but when I arrived with my*
33 *bags he'd hold the door for me*”. Gwen also asserts order by addressing young people hanging
34 out in the lobby: “*Hey guys, you're smoking weed, I don't care, okay, but I have kids and I*
35 *don't want them to come home and smell that, so since it's nice out, go smoke outside*”. Her
36 personal initiative is made possible because she has lived there for a long time and can rely on
37 a network of relationships in case of trouble (e.g., cousins, older siblings, or parents).
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41 *Collective restoration of order.* Other initiatives to restore order are collective or rely on
42 activating a network of relationships. Cheikh, who grew up in Senegal, recounts: “*It was also*
43 *social housing, but seeing our elders in retirement taking care of the neighborhood, we grew*
44 *up in that. It made us want to continue loving our neighborhood. What struck me the most*
45 *was that they bought cans of paint. They'd come on the weekend, they'd tell us we were going*
46 *to do a Set Setal, clean up the neighborhood. So everyone would bring a broom [...]. And it*
47 *was often a moment of sharing, really friendly moments. There was a mix of all generations.*
48 *Little kids, teenagers, women, and men. [...] It was like a block party, but with a goal:*
49 *keeping the neighborhood clean*”. Beyond following the elders' efforts to care for the place,
50 Cheikh is active in a network of neighbors working to prevent the residence from becoming a
51 drug trafficking site: “*One time, a neighbor texted me. 'Cheikh, do you mind coming down?' I*
52 *went down, and he said, 'Yeah, there are a lot of teenagers down there, and I don't want to*
53 *approach them alone.' He wanted to talk to them, but since he knew they were a bit tough,*
54 *and you could see they weren't angels... So we showed up, and when the kids saw three of us*
55 *coming, they started talking, hiding their cigarettes and the drugs they had. And then we said,*
56 *'What are you guys doing here?' And that's how they realized we wouldn't let things slide*”.
57 To organize his action, Cheikh is considering creating a residents' collective to “*be a force for*
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3 *proposals with the caretaker, who's the main contact with the social landlord who needs to*
4 *take action”.*
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6 *Restoring order: a residential competence.* These observations show that competence is not
7 limited to meeting institutionally predefined performance standards (Shove, 2012) but also
8 includes the ability to maintain order in the residence, often informally and spontaneously.
9 Individual or collective initiatives help restore order without directly targeting waste sorting.
10 These initiatives rely on residents' competencies (e.g., pruning hedges, reprimanding). Such
11 behaviors that re-establish residential rules could theoretically influence others, like sorting.
12 Theoretically, visibly restoring a rule (e.g., picking up an orange off the ground) increases the
13 likelihood of respecting another rule (e.g., not picking up lost money) (Keizer et al., 2013). By
14 visibly restoring a norm (even one unrelated to sorting), residents activate a cooperative
15 mindset that can lead to respecting other rules not directly connected. Norms are not
16 independent but can reinforce one another (Keizer et al., 2013). Altruistic residential
17 behaviors could therefore have an unexpected impact on other behaviors such as waste
18 sorting.
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23 4. DISCUSSION

24 4.1. Bridging psychological and practice theories to better 25 understand waste sorting in collective housing

26 This study contributes to the growing research movement aiming to articulate rather than
27 oppose “ABC”-type behavioral science models and practice theories (Breadsell et al., 2019).
28 While practice theories integrate sorting into broader consumption routines (Dyen et al., 2018;
29 Katan, 2022) by focusing more directly on context, the “ABC” model enables the activation
30 of concrete mechanisms and the potential reinforcement of individual agency (Whitmarsh et
31 al., 2011). By drawing on critical realism (Archer et al., 2013), it becomes possible to identify
32 generative mechanisms (e.g., psychological mechanisms) that shape the potentialities of
33 sorting practices within residential contexts, whose most visible and empirical manifestations
34 are individual responses. Collective housing provides a strategic field for examining how
35 general mechanisms concretely appear within complex configurations that shape sorting
36 practices. These mechanisms are valuable for linking residents' narratives with solid
37 theoretical foundations that are actionable for public stakeholders. Analyzing materiality,
38 meaning, and competence (Shove et al., 2012) thus allows for the integral study of how
39 collective housing triggers psychological mechanisms that influence waste sorting
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46 Our results contribute to explaining how residential materiality, meaning, and competences
47 shape residents' responses toward waste sorting. This approach highlights that psychological
48 mechanisms are not merely internal drivers but situated generative processes that manifest
49 through material, symbolic, and social configurations. Understanding how these mechanisms
50 emerge across different contexts contributes to a “full research circle” (Cialdini, 1980),
51 providing grounded insights that can later inform hypothesis testing in laboratory or field
52 interventions (Paluck and Shah, 2025). Analyzing material elements through residents'
53 accounts highlights the importance of residential affordances and emotions. Contrary to
54 approaches based on sorting determinants (Geiger et al., 2019), the provision and accessibility
55 of bins, the ergonomics of sorting stations, and housing characteristics are not merely
56 independent factors contributing to explaining sorting. These elements intimately shape
57 sorting practices by providing residential “affordances” (Gibson, 1977) that invite residents to
58 sort or not. Residents directly perceive these action possibilities, thereby preparing them
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3 immediately and automatically to sort or, conversely, to adopt alternative behaviors (e.g.,
4 throwing waste out the window). Beyond affordances, residential materiality contains
5 olfactory, visual, auditory, and tactile cues that trigger universal emotions (Ekman, 1992).
6 Fear and disgust are the two main emotions experienced by residents, leading to avoidance
7 behaviors regarding sorting. This focus on residential emotions contributes to an embodied
8 view of practices (Wallenborn and Wilhite, 2014), while also offering operational levers. To
9 improve affordances and emotional responses, it is necessary to shift focus away from the
10 individual and intervene effectively upstream on the socio-spatial configurations that trigger
11 shared reactions.
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15 Beyond a stimulus-response vision, residents also actively interpret their residence to
16 reconstruct local norms (Fornara et al., 2011) and experience reflective moral emotions
17 (Tracy et al., 2007) regarding sorting. Due to the low visibility of sorting practices, residents
18 rely on indirect cues (e.g., bin filling speed, cleanliness behaviors, sounds) to reconstruct the
19 extent to which others sort or believe it is important to do so. These strategies help explain
20 how social norms are concretely constructed in everyday life (Cialdini and Jacobson., 2021).
21 This sense-making effort is accompanied by reflective moral emotions that involve actively
22 comparing oneself to a moral standard (Tracy et al., 2007). Waste sorting is therefore not just
23 a neutral routine to be minimized cognitively but elicits shame (e.g., being seen not sorting) or
24 guilt (e.g., witnessing others' efforts without contributing). Under certain conditions, sorting
25 could even elicit collective pride (e.g., receiving collective feedback). This search for
26 residential meaning is a decisive element in waste sorting within collective housing.
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30 Sorting in the residence can also be influenced by neighborhood behaviors not directly related
31 to sorting. Throwing objects out of windows, leaving waste on the ground, excessive noise,
32 and smoking in hallways all violate shared living rules. Theoretically, these repeated
33 transgressions could fuel a disorder contagion (Keizer et al., 2008), whereby non-compliance
34 with one social norm reduces the likelihood of respecting another. Consistent with the idea of
35 practices forming a system (Shove et al., 2012), social norms are not independent but
36 interrelated. Our results show that non-sorting-related behaviors may reduce residents'
37 motivation to make an effort in sorting because of visible non-cooperative actions. Residents'
38 search for meaning also concerns rule compliance in general, suggesting new interventions
39 that focus more on eliminating disorder cues than on modifying individual residents.
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43 In collective housing, sorting also requires competences to adapt to the specific constraints of
44 the residential context. While sorting practices are generally studied within the household
45 (Dyen et al., 2018; Breadsell et al., 2019), our study focuses on shared spaces in collective
46 housing. Consumption routines (Dyen et al., 2018) and logistical strategies (Monnot et al.,
47 2014) imply that residents traverse and use shared spaces to dispose of waste and sort. This
48 process of carrying waste through the residence involves its own strategies and collective
49 coordination (e.g., with children, domestic workers). For sorting to spread within the
50 residence, communication competences around sorting (notes, exchanges, conversations) can
51 be highly valuable and should also address other stakeholders (caretakers, municipal
52 services). To encourage active communication about sorting, new interventions could aim to
53 modify relationships between neighbors rather than treating residents as independent and
54 isolated individuals (Valente, 2012). Beyond communication explicitly about sorting,
55 residents also communicate indirectly by taking care of their living environment. These
56 competences, used in service of the residence, could theoretically encourage efforts in sorting
57 as well. Keizer et al. (2013) showed that visibly restoring one norm increases the likelihood of
58 respecting another, through a mechanism of inter-norm reinforcement. In a residential
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3 context, pruning hedges or collectively cleaning shared spaces could therefore increase the
4 willingness to respect other residential rules, including sorting.
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6 **4.2. Improving interventions at the residential scale**

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8 A better understanding of materiality, meaning, and competences (Shove et al. 2012) in
9 collective housing allows for an in-depth exploration of psychological mechanisms as they
10 manifest at the residential scale. These situated mechanisms provide opportunities to
11 implement new interventions aimed at effectively improving recycling in collective housing
12 (see table 2). Field diagnostics are an essential component of social marketing that remain
13 underutilized, enabling the identification of barriers and benefits associated with recycling
14 (McKenzie-Mohr and Schultz, 2014) or the co-creation of new tools with residents (Rundle-
15 Thiele et al., 2021). In the context of an intervention in collective housing, field diagnostics
16 involve identifying the most important contextual factors. A good diagnostic should not be
17 exhaustive but should focus attention on as few key parameters as possible. Our study offers a
18 rich (material, meaning, competence) and parsimonious analytical framework that allows for
19 the rapid and careful identification of concrete levers for action in collective housing. Table 1
20 summarizes the main mechanisms and potential levers. These recommendations help make
21 practice theories more actionable for public policy, by moving beyond an exclusive focus on
22 the individual, and by reframing context not as a constraint, but as a generative field for
23 intervention.
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27 A first set of strategies involves directly intervening on the materiality of the residence to
28 modify shared residential affordances and emotions. To detect temptations to act contrary to
29 recycling and triggers of fear or disgust in communal areas, specific procedures should be
30 developed. A residential diagnostic activity could be organized, in which participants stop at
31 different locations within the building (e.g., entrance hall, floor, garden). They would
32 complete an in-situ questionnaire addressing emotions (e.g., fear, disgust), their triggers (e.g.,
33 lack of lighting), and situational action tendencies (e.g., throwing away litter). This approach
34 would help reduce memory biases associated with retrospective verbal reports (Podsakoff et
35 al., 2003). Such in-situ methods would make it possible to modify directly triggers of
36 affordances and emotions without relying solely on residents' retrospective memories.
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40 A second set of strategies aims to modify the meaning of recycling within the residence, by
41 acting on the perception of residential norms, on the moral emotions associated with
42 recycling, and on the perceived tendency toward disorder. Our results show that recycling is
43 not solely viewed from a macrosocial perspective and that residents try to determine whether
44 their personal recycling behavior also makes sense at the residential scale. Communicating
45 local norms (Fornara et al., 2011) could be particularly effective at the building level: "*8 out
46 of 10 neighbors in your building think recycling is important*". When recycling behavior is
47 still a minority, communicating dynamic norms (Sparkman et al., 2021), such as "*More and
48 more of your neighbors in this building are recycling*" would be more appropriate to highlight
49 the positive evolution of practices. By using technologies to detect recycled materials, it
50 would be possible to foster collective pride, especially by comparing collective recycling
51 results with those of other buildings or residences. However, these strategies entail additional
52 costs for collecting residential data and communicating it to residents. A final strategy
53 involves quickly removing visible signs of disorder (Keizer et al., 2008). Litter on the ground,
54 graffiti, signs of wear, and acts of incivility symbolize the transgression of official rules and
55 reduce the motivation to comply with other restrictive norms. An important challenge is
56 therefore to eliminate these signs of disorder in order to improve recycling within the
57 residence.
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4 A third set of strategies focuses on strengthening residents' competences, particularly
5 regarding waste dispatch, communication, and the ability to care for shared spaces. To help
6 households in collective housing better control their waste dispatch, in-home advisory visits
7 could be conducted. These visits would aim to help households better manage the behavior of
8 children or housekeeper, while also developing logistics adapted to their constraints (e.g.,
9 limited storage space) (Monnot et al., 2014). In addition to these visits, network interventions
10 (Valente, 2012) could be tested at the residential level. These interventions aim to act on
11 relationships between neighbors rather than on individuals themselves. Using sociometric
12 surveys (e.g., counting nominations), an influential neighbor could be recruited to promote
13 recycling in the residence, thus enhancing the effectiveness of block leaders (Burn, 1991;
14 Varotto & Spagnoli, 2017). Several indicators can be used to identify an "influential
15 neighbor" (Borgatti et al., 2018): knowing many neighbors, having access to isolated
16 subgroups, or knowing a few people who know many others. When social ties are weak,
17 community activities can help foster relationships between residents (e.g., clean-up
18 challenges, shared gardens). These advisory visits and network interventions could be
19 implemented as part of a residential project group. This group would help implement actions
20 at the right time, in the right place, and over time. A project group would also help enhance
21 residential competences by simultaneously modifying both the materiality and the residential
22 meaning attributed to recycling.
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28 *4.3. Limitations and research perspectives*

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30 Despite its theoretical and operational contributions, this study has several limitations that
31 also point to avenues for future research. A first limitation lies in the absence of quantified
32 observations at the residential scale. To better understand how the residential context deeply
33 influences recycling, observational protocols could be used to complement the study of
34 recycling within the household and shared spaces. For example, it would be possible to use
35 bins or collection points equipped with sensors to identify recycled materials (Varotto et al.,
36 2017), while also employing ethnographic methods where residents are asked to regularly
37 film their own waste management practices within the residence. These observations could
38 help document "change points" (Watson et al., 2020) that may serve as intervention
39 opportunities not only within the home but also in shared spaces. These key moments in
40 everyday routines, when resource use can be modified, may also extend to residents'
41 purchasing behaviors, insofar as these upstream decisions determine what will eventually be
42 discarded by the household.
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46 Observations would also help empirically test some of the residential levers identified through
47 our findings. For instance, an intervention emphasizing altruistic behaviors could be tested by
48 comparing two similar residences in terms of recycling performance (e.g., socioeconomic
49 level, population density). In a test residence, posters, newsletters, or photos could highlight
50 the skills residents use in service of others or the residence (e.g., helping an elderly person,
51 trimming hedges). Recycling performance would be tracked over time and compared with a
52 control residence. Mechanisms to better understand inter-norm reinforcement and order
53 restoration would be evaluated through various methods (e.g., surveys, interviews). Beyond
54 operational implications, such investigations would provide theoretical insights by showing
55 how waste sorting is embedded within broader consumption practices. This perspective
56 encourages researchers to move beyond the traditional focus on household consumption
57 decisions, by integrating residential dynamics as a constitutive dimension of consumption
58 practices themselves. In this view, the residence is not merely a physical backdrop but an
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3 active space of meaning-making, negotiation, and co-regulation of consumption behaviors.
4 This influence of the residential context as a whole aligns with a more integrative perspective.
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7 Third, this study opens the way for a systemic theory of waste sorting. By focusing on the
8 intermediate scale of the residence, our study provides a deeper understanding of how the
9 residential context shapes sorting decisions. To further integrate individual-level models with
10 practice theories, it becomes necessary to move beyond linear thinking toward systemic
11 thinking (Keller et al. 2022). Unlike linear thinking, systemic thinking accounts for dynamic
12 interactions and feedback loops between elements of a social configuration. Dominant
13 theoretical models, often based on regressions, assume relative independence between
14 variables (Cohen et al., 2013). In contrast, a systemic approach to recycling would make it
15 possible to formalize complex configurations involving 5, 10, or even 15 interdependent
16 variables. Moreover, this approach allows for the consideration of feedback loops, where a
17 cause influences its own intensity over time. Tools such as qualitative causal loop diagrams
18 (Lane, 2008) could be mobilized using interviews with residents to map these feedback
19 mechanisms. By highlighting the central role of the residential context, this study already
20 contributes to operationalizing social practice theory from a systemic perspective, showing
21 how elements of materiality, competence, and meaning (Shove et al., 2012) influence
22 decisions through situated psychological mechanisms. An approach that uses systemic
23 thinking tools would further advance the core intuition that practices are not stable blocks but
24 dynamic, situated configurations, entangled within material and social contexts (Nicolini,
25 2012).
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18 [explained/index.php?title=EU_statistics_on_income_and_living_conditions_\(EU-](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_statistics_on_income_and_living_conditions_(EU-SILC)_methodology-_economic_strain_linked_to_dwelling)
19 [SILC\)_methodology-_economic_strain_linked_to_dwelling](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_statistics_on_income_and_living_conditions_(EU-SILC)_methodology-_economic_strain_linked_to_dwelling)
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