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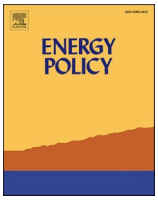

Under one roof: The social relations and relational work of energy retrofit for the occupants of multi-owned properties

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ABSTRACT

In the UK a significant proportion of Multi-Owned Properties (MoPs) – characterised by buildings segmented into individually owned flats – must undergo retrofitting to achieve net zero emissions. Despite this requirement, advancement has been minimal, with existing government policy failing to consider a pivotal role of social dynamics among residents in the retrofit decision-making process. This research adopts an innovative perspective grounded in relational sociology, leveraging Viviana A. Zelizer's concept of 'relational work' and integrating two of the three types of social relations identified by Hargreaves and Middlemiss' (intimacy and institutions) to dissect the retrofit challenges faced by owners of historic MoPs in South Glasgow, UK. The study reveals that the necessity for heightened relational work among property owners acts as a barrier to retrofit initiative. Nevertheless, it identifies potential pathway to invigorate the retrofit sector by enhancing neighbourly connections and recognising the influential, yet underexplored, role of property managers in facilitating retrofit activities within MoPs. This inquiry not only underscores the significance of social relations in environmental retrofit projects but also suggests a re-evaluation of policy frameworks to accommodate the social intricacies inherent in MoPs, thereby fostering a more conducive environment for achieving net-zero targets.

1. Introduction

The residential sector in the European Union (EU) accounted 12% of CO2 emissions in 2020 and this percentage has remained stubbornly high since 2016 (EEA, 2022). For countries to meet their targets they must undertake a significant programme for energy efficiency in domestic properties over the coming decades.

The UK faces particular challenges in decarbonising its domestic building stock. UK residential buildings accounted for roughly 16% of UK territorial greenhouse gas (GHG) emissions in 2021, with little progress in reducing emissions since 2014 (CCC, 2022). Within Europe the UK housing stock consists of the highest proportion (at 55%) of older (pre-1960) residential living space compared to comparator countries (BPIE, 2011), is among the least energy efficient (BPIE, 2011), and is the most dependent upon on-grid gas heating (Sahni et al., 2017).

The UK must install tenfold as many energy-efficient measures by 2028 to align with the Climate Change Committee's Balanced Pathway to net-zero by 2050, as the country is currently not upgrading its housing stock at the rate required to meet its net-zero target (CCC, 2022). However, when energy prices in the UK soared in 2022 (Stewart and Bolton, 2022), the need to supply affordable heating and a reduction in domestic energy demand is even greater.

To date, the problem of improving energy-efficiency of the UK's housing stock has been largely viewed through architectural, economic, or psychological lenses (Abrahamse and Shwom, 2018). In general terms, architectural approaches focus on technical solutions, economics focuses on how to drive retrofit through appeals to rational decision-making and psychology focuses on the values and beliefs of the individual that might help or hinder uptake of retrofit measures. Thus, drawing on these disciplines, policy-making has thus far prioritised

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technological fixes, interventions designed to appeal to the self-interest of individual energy users (e.g. grants, loans and price support) and, drawing on psychology, how retrofit can be framed to better appeal to individual values and beliefs. These approaches have proved limited in that their focus is not on understanding contextual factors including peculiarities of place and household dynamics (Hargreaves and Middlemiss, 2020; Emden, 2023; Owen et al., 2023). Moreover, retrofit decision-making that is collective, such as decisions made in Multi-owned Properties (MoPs), buildings subdivided into separately owned flats, are not well explained by the existing theories, which do not consider how the social relations between neighbours affect retrofit decision-making. As McCarthy et al. (2018) state 'a model which focuses on the actions of individuals is unlikely to capture the necessary collective aspect of the investment behaviour' in MoPs (McCarthy et al., 2018).

The challenge of retrofit in MoPs is a significant one. Across Europe 46% of the population live in flats (European Union, 2022). In the UK flats are less common but still significant. For example, in England and Wales 22% of households live in flats (ONS, 2021) and in Scotland 36% of households (Scotland's Census, 2022). Compared to other forms of housing, flats tend to be somewhat more energy efficient than other dwelling types becuase they have fewer external walls (ONS, 2022b). However, the interventions to maintain or improve flats are problematic because of difficulties of reaching agreement between co-owners (LEAF, 2016). This is proving a significant impediment to energy efficiency where the uptake of energy efficiency measures in blocks of flats is not keeping pace with those of other properties in the UK (Bright and Weatherall, 2017). Moving forward, the whole-building retrofit approach required to deliver net zero housing (BEIS, 2017) will demand interventions in parts of buildings that are communally owned or managed, which will, in turn, demand agreement between owners in accordance with applicable property law rules. Without addressing the collective decision-making of MoPs, then, it will be a challenge to deliver on commitments to decarbonise building stock.

In this paper, retrofit is understood to mean the introduction of new materials, equipment and hardware into existing buildings, with the aim of reducing the energy consumption of that building (Baeli, 2013). We understand retrofit to be one form of renovation, a broader term that means any building repair or improvement. In our methods section (see Section 3) we explain how, in order to gain a more complete understanding of the social relations around retrofit, we deliberately targeted homeowners who had undertaken renovations both for energy efficiency and, more commonly, other forms of home improvements. Building on Hargreaves and Middlemiss (2020), this paper adopts ideas from relational sociology (Bourdieu, 1977, 1984; Crossley, 2011; Elias, 1991; Simmel, 1978; V.A. Zelizer, 1997) to better understand decision-making over retrofit in historic MoPs.

Relational sociology focuses on the social dynamics of, for example, negotiation and information sharing and, significantly, the micro-level processes that shape decision-making (Bandelj, 2012), such as those around energy consumption or deciding whether to undertake a domestic retrofit project. While some studies have explored the social relations of retrofit within and beyond owner-occupied buildings (Bolton et al., 2023), the research on retrofit in MoPs is scarce (Weatherall et al., 2018) and, as far as the authors are aware, no work exists using a relational sociology lens to explore the retrofit challenge in MoPs. This paper focuses on the 'able to pay', those who are able to make a financial contribution to retrofit (see Section 3 for our full definition), allowing the relational challenges of retrofit, as opposed to financial constraints, to be highlighted.

To help address this gap, this paper answers the following questions:

- What are the key social relations shaping retrofit among 'able to pay' dwellers of tenements in the case study area of Glasgow?
- How do the social relations and relational work of renovations in MoPs influence the pace, depth and character of MOP retrofit?

The paper is structured as follows. First, we present a literature review which outlines our relational approach before exploring what extant literature suggests about social relations in MoPs. Second, we present our methods. Third, we present our findings and analyses before, fourth, discussing how identified social relations help and/or hinder retrofit. We conclude by discussing the significance of our findings to theory, practice and policy.

2. Literature review

The introduction of our interpretation of a social relations approach begins by deploying or adapting concepts from relational sociology and explaining its promise in the context of current policy failure. This is followed by a consideration of what extant research reveals about social relations in MoPs. Subsequent sections provide context to a case study in Glasgow, from which primary data is gathered, to highlight some of the unique aspects of MoPs in Scotland in terms of governance and conservation.

2.1. The need for a relational approach

Scholarly work adopting a relational perspective on energy demand suggests 'social practices are the unit of change, not the household or the individual, if one wants to change household energy consumption' (Abrahamse and Shwom, 2018). Exploring the relevant resources exchanged within and across patterns of social relationships offers a productive method of understanding these practices and their formation (Abrahamse and Shwom, 2018; Wasserman and Faust, 1994). Such insights draw heavily on a relational sociology perspective that holds that economic transactions are best understood as just one form of social interaction (Zelizer, 2000, 2012). This approach focuses on the social dynamics, of, for example, negotiation and information sharing, that underpin decision-making. Significantly for our purposes, this includes the micro-level process which shape household decision-making (Bandelj, 2012), such as around energy consumption or deciding whether or not to undertake a domestic retrofitting project.

Hargreaves and Middlemiss (2020) have usefully identified three interrelated types of social relations relevant to domestic energy consumption. These are the: 1) relations with family and friends, 2) relations with agencies and communities and 3) relations of identity (see Table 1). These types of social relations influence renovations (and hence retrofit) in multiple (and potentially overlapping) ways.

Table 1
Types of social relations impacting on energy demand (Hargreaves and Middlemiss, 2020).

Social relation	Definition	Examples	Influence on energy use
Relations with family and friends	Relationships of care and intimacy	Parent, child, husband, partner, sister, cousin, aunt, friend, housemate	Learning and shaping practices, sharing energy services, giving advice, lending money
Relations with agencies and communities	Relationships of service provision and activism	Landlords, energy companies, energy advice agencies, tradespeople, community energy groups	Energy consumption advice, energy efficiency support, constraints on choice of tariff or efficiency measure
Relations of identity	Relationships of solidarity and oppression	Age, gender, class, race, disability status, single-parent household, welfare recipient	Access to support due to membership (or not) of a specific category, practices shaped by belonging to that category

A key concept in relational sociology is 'relational work', developed by Viviana A. Zelizer. This concept pertains to the efforts invested in establishing and sustaining social relations through the social practices of boundary making. Zelizer elucidates that:

> 'For each distinct category of social relations, people erect a boundary, mark the boundary by means of names and practices, establish a set of distinctive understandings that operate within that boundary, designate certain sorts of economic transactions as appropriate for the relation, bar other transactions as inappropriate, and adopt certain media for reckoning and facilitating economic transactions within the relation. I call that process relational work' (Zelizer, 2012).

It is important to note that relational work involves real effort and the consumption of depleting material and immaterial resources (time, money, patience, etc.). By developing policies and incentives based upon a belief that human interaction can be reduced to financial transactions alone, the effort of the relational work involved in sourcing and negotiating advice, funding, and researching tradespersons is ignored. We suggest that this is important in the present context because the concept of relatioanl work provides a novel means to explore and explain the challenges of retrofit which non-sociological approaches and public policy often miss. From a relational perspective 'the production of trust or repairing of distrust' (Middlemiss et al., 2024, p. 2) is key; in a previous paper we set out how trust is seen as an outcome of positive interactions between affiliated parties and a function of positive past experiences (Middlemiss et al., 2024). This suggests where there is an absence of positive past experiences much relational work will be required to establish trust. This is likely to be the case for retrofit becuase it confronts homeowners with a host of unfamiliar actors and processes. Such a perspective, therefore, provides an explanation for why financial incentives alone frequently prove insufficient in motivating retrofit uptake.

Another key issue is that individuals rely on relational work carried out by others and, significantly for the argument presented in this paper, a key factor in relational work is the legal system. By engaging in its own form of relational work, at a higher institutional level and applying rules more generally, the legal system helps to establish and clarify cultural norms. Drawing on Zelizer, Block (2012) asserts that the legal system provides 'individuals in daily life with the support they need to incorporate those norms into their relational work' (Block, 2013). The doctrine of the self-regulating free market views regulations as burdensome, creating inefficiencies which deter productive action. An alternative perspective emerges from the concept of relational work: regulations, when effectively implemented, can ease action by decreasing the relational work necessary for any given interaction. For example, without consumer protection legislation consumers would need to take greater care to establish that a contractor offers basic levels of service provision, as the risks of contracting would be far higher with no recourse to statute in the event of malpractice. Thus, to provide a foretaste of the findings to come, this is particularly significant in the case study where regulations provide insufficient support to deliver renovations in MoPs.

2.2. Social relations and MoPs

With the odd exception (Bolton et al., 2023; Hargreaves and Middlemiss, 2020; Emden, 2023) relational sociology has not been applied to understanding the challenge of how households make decisions on renovations, particularly energy retrofit. Relational approaches are particularly absent in the exploration of energy retrofit in MoPs, where they are arguably most important than individually owned and occupied buildings. However, there are several reasons to suggest that social relations in MoPs are different from those in other owner-occupier households. To understand how social relations in MoPs are different, requires starting with perspectives from other disciplines, including built environment studies and law.

2.2.1. MoPs and social relations

Urban planning scholarship suggests a mixed picture of social relations in MoPs. Some research highlights negative perspectives (McCarthy and Saegert, 1978; Power, 2015; Thomas et al., 2011); residents of apartments may show an unwillingness to engage with or outright hostility to neighbours, resulting from small living spaces, offensive smells or noise. Some studies present a more positive perspective. For example, Skjaeveland and Garling (1997) suggest that where apartment blocks are of a sufficient size, there are more opportunities for forming close personal connections in the building. In addition, Baker (2013) reports that most neighbours succeed in 'striking a balance between privacy and contact' (Baker, 2013, p. 275) and they enjoy largely harmonious relations with neighbours. While the literature indicates that MoPs provide heightened interaction with neighbours, the variation in social relations in MoPs to which this research attests is supportive of critiques of 'physical determinism' (Gans, 1968), which posits that human behaviour has physical causes, in this case in the characteristics of the built environment. We note that these critiques complement our relational approach, which holds that it is social relationships which are the most important factor in shaping how lives are lived in MoPs, not urban form.

2.2.2. MoPs governance and social relations

The role of building governance is another important factor that makes social relations around retrofit in MoPs different. For example, while the decision-making unit in a detached owner-occupied house is normally the resident household, in MoPs multiple households share responsibility for communally owned or managed parts of the building. Hence co-owners have to negotiate and decide upon retrofit decisions that affect these areas of the building. The governance of MoPs has been explored from various perspectives.

One approach is to look at the problem from the perspective of law. McCarthy et al. (2018) highlight two key bodies of law that shape collective decision-making in MoPs: law of property and law of associations. Property law determines who has the power to undertake retrofit work on which parts of a building, such as roofs or foundations. The law of associations sets the rules about collective decision-making and collective responsibility, meeting arrangements and voting thresholds for different types of interventions. McCarthy et al. (2018) explained the 'combination of these rules will determine who holds responsibility for the costs of the work, and whether and how finance can be accessed' (2018, p. 86). Using our relational lens, we conceptualize these rules as providing support for relational work; they determine categories of social relations, mark boundaries and shape relational practices, within which social relations in MoPs are formed and negotiated.

Complementing legal scholarship, ethnographic work on MoPs suggests the form of owners' association may have a significant impact on the social relations in a building. For example, Pink (2004) work highlights how owners' associations in Spain provide a forum for frequent contact between owners. This offers opportunities for more direct social engagement, albeit either fraught with tension and/or animosity or intimate and productive.

Another approach considers decision-making within MoPs. Here some evidence comes from research into energy efficiency decision-making in condominiums in France. For example, Brisepierre (2011) highlights a prominent role for 'champions', owners within the buildings who lead on interventions by persuading other residents to take collective action. Such research indicates that 'collective action in a condominium depends on the skills of the actors and the capacity for building consensus' (McCarthy et al., 2018). In other words, collective decision-making is dependent on what is referred to as relational work.

To summarise, MoPs necessitate a form of governance for collective responsibilities, implying a more significant role for social relations with neighbours than might be anticipated in other buildings, where decision-making primarily rests with individual households. The requirement for collective action fosters increased intimacy, manifesting either as heightened animosity or stronger friendship. Moreover, it

demands substantial relational work, including effective leadership, to propel projects forward.

2.3. Case study context: MoPs governance in Scotland

This section concentrates on providing key context of the case study to enhance the understanding of the findings and analysis.

In Scotland MoPs are typically referred to as tenements.[1] According to section 26 of the Tenements (Scotland) Act 2004 (UK Government, 2004) a 'tenement' means a 'building or a part of a building which comprises two related flats which, or more than two such flats at least two of which -

a) are, or are designed to be, in separate ownership; and
b) are divided from each other horizontally' (2004, n.p.).[2]

Governance arrangements apply to all households sharing one roof (rather than the whole building which can cover a whole city block), all of which are typically (but not always) accessed by one stairwell, referred to as a close.[3]

The Tenements (Scotland) Act 2004, together with common law, establish default areas of common ownership and also shared responsibility in tenements. Where the default Tenement Management Scheme applies, which for ease will be taken as the focus of this analysis,[4] management of all areas of collective responsibility (e.g. the roof, foundations, and external wall) is governed by simple majority voting, with the exception of when work is deemed to be an improvement, in which case unanimity amongst owners is required. Notably, Section 69 of the Climate Change (Scotland) Act 2009 altered the Tenement Management Scheme found in Schedule 1 of the Tenements (Scotland) Act 2004, by specifying that insulation installation is within the scope of maintenance. Other aspects, such as the installation of solar panels, are not so categorised.[5] It is important to note that unlike most continental European jurisdictions, the governance arrangements of MoPs in Scotland (together with England and Wales) carry no obligation amongst owners to form an owners' association to oversee collective interests.[6] Weatherall et al. (2018) explain the downsides of this approach: 'the absence of any necessary, formalized corporate structure prevents flat owners jointly accessing loans or grants to pay for energy upgrades' (Weatherall et al., 2018, p1650). We can also add that where there are disputes between contractors and owners, because there is no corporate body representing owners, an individual householder can be held responsible for payment of collective works (Under One Roof, 2022).

Another feature of the MoPs landscape in Scotland, especially prominent in the west of the country, are professional property managers, commonly called 'factors'. Property factors are agents contracted by homeowners to provide ongoing management of collectively owned features, such as roofs or closes.[7] Property factors can be private businesses, local authorities or social landlords.[8] Factors have an important relational role: addressing homeowners' requests, keeping people informed, arranging votes, sanctioning non-payers, managing traders and arranging works. The exact responsibilities of factors are stipulated by individual contracts with homeowners, but often these will entail inspection and maintenance tasks. The relationship between property factors and their clients is often an uneasy one; as Robertson (2019) states 'Scotland traditionally holds a deep-seated cultural prejudice against factors' (Robertson, 2019, p. 43). Addressing public concerns, the Property Factors (Scotland) Act 2011 sought to more tightly regulate the property factoring sector. Factors must now be registered and they are governed by the Factors Code of Conduct (The Scottish Government, 2021), which sets out minimum standards. However, their remit remains narrow, with no attempt as yet being made to increase their responsibility regarding energy efficiency; as Beckmann & Roaf (2012) state, the Act 'focuses mainly on issues of financial probity rather than on building maintenance, knowledge and skills' (2012, p. 4).

The limitations of governance arrangements are most visible in pre-1919 tenements in Scotland, which account for approximately 31% (and 184 000 dwellings) of Scottish tenements (Scottish Government, 2020b). Because of their age and governance shortcomings they represent the 'hardest nut to crack for workable retrofit solutions' (Gibb, 2023). As of 2019, over two-thirds (71%) of pre-1919 buildings are in a state of 'critical disrepair', meaning disrepair to 'critical elements', those which ensure weather tightness, structural stability and prevent further deterioration, with 32% in need of urgent repair (Scottish Government, 2020b). While figures specifically for pre-1919 tenements do not exist, Robertson (2019) notes that in tenements the situation is likely considerably worse due to governance arrangements. In terms of our energy research, this is particularly significant because energy efficiency is determined largely by: 1) the age of a building (ONS, 2022a); and 2) the extent of maintenance (RICS, 2019). While a figure for average energy efficiency in pre-1919 tenements is not available, 80% of pre-1919 buildings in Scotland and 40% of tenements are below Energy Performance Certificate (EPC) band C (Scottish Government, 2020b).

Recently, the importance of MoP governance has gained recognition among decision-makers. The Scottish Government has introduced proposals requiring all buildings to reach an EPC band C or better by 2033 and to adopt zero emissions heating systems, such as heat pumps and district heating, by 2045 (Scottish Government, 2021a). To achieve this, the Scottish Parliament's Working Group on Maintenance of Tenement Scheme Property has highlighted the need for 'improved organisational capabilities' to enhance energy efficiency in tenements. Consequently,

[1] In other places tenements may be called condominiums, apartment blocks, etc.

[2] The term tenement is used inconsistently in Scottish Government publications. In legal terms tenements consist of flats positioned vertically but in the Scottish House Condition Survey flats are disaggregated into tenements and other flats which includes dwelling types (such as four in a block flats), which would also be considered tenements in law.

[3] 'Close' is often used also to describe the unit of governance, e.g. 'we've got a good close for cooperation', or all of the flats off of the stairwell, e.g. 'all of the flats up the close need repaired'. The Tenements (Scotland) Act 2004, section 29, defines 'close' as meaning 'a connected passage, stairs and landings within a tenement building which together constitute a common access to two or more of the flats'. Some tenements will incorporate 'main door' properties at ground level, affording an exclusive access without the need to use the close (although depending on the circumstances of the building they may also have recourse to the close to gain access to a shared garden).

[4] The Tenements (Scotland) Act 2004 applies the default scheme found in schedule 1 of the Act in many circumstances, but not where it has been ousted by some other provision expressly being made for a property (including in the various title deeds for the units of the tenement). Where such provision has been made, the common law rules around common property would apply (with an historic example of that being provided in the case of Rafique v Amin 1997 SLT 1385).

[5] For a more detailed explanation of the law relating to MoPs in Scotland see Weatherall et al., (2018).

[6] At the time of writing the Scottish Law Commission has produced a discussion paper on compulsory owners' associations (Scottish Law Commission, 2024). The Commission's findings are awaited. Regarding England and Wales, a scheme that might have provided for a degree of compulsory association has been enacted (in the Commonhold and Leasehold Reform Act 2002), but this failed to gain any traction and only a very small number of new developments have proceeded with a commonhold arrangement.

[7] Owners can also 'self-factor', undertake factoring duties themselves. In this case they do not abide by the same regulations as factors which operate commercially (Under One Roof, 2023).

[8] Social landlords are often referred to as 'housing associations' (and may even incorporate that term within their name). They act as regulated, not-for-profit landlords offering non-market tenancies, in terms of the Housing (Scotland) Act 2001. Often, the properties they let share a building or features with owner-occupied property, and in those circumstances they may act as property factor for the whole building.

Table 2
Key characteristics of the case study area.[91].

	Crosshill	Glasgow	Scotland
Mean Gross Household Income (p/w)	£807	£635	£699
Tenements (% of total dwellings)	65	61	28
Households per hectare	24.5	15.8	0.3
Pre-1919 dwellings	89%	28%	20%
Fuel Poverty	35%	25%	25%
Tenure[a]			
Owner-occupied	61%	47%	64%
Social renting	4%	36%	24%
Private rented	32%	16%	11%
Energy Efficiency (mean SAP rating)	59	68	66

[a] The census also includes the category 'other rented' which accounts for the remaining households.

the Working Group proposed compulsory owners' associations be enacted in law, along with other measures such as a compulsory 'float' to which owners would contribute to maintenance costs (RICS, 2019). However, it is highly unlikely that this will become law before 2026.

3. Methods

This paper explores the social relations of retrofit in the Crosshill area of Glasgow's south side. The area, with a population of 2127 (SIMD, 2020), has a number of key features that informed our decision to undertake a case study there (see Table 2).

First, the area's architecture is dominated by tenements (see Section 1.3); 65% of dwellings are classified as flats in Crosshill compared to the 61% figure for Glasgow (Scotland's Census, 2011). The remainder of the houses are of a variety of types, e.g. 11% detached, 7% semi-detached and 4% terraced. Owing to the dominance of the MoP building type, Crosshill is a densely populated area, with 24.5 households per hectare (Scotland's Census, 2011).

Second, Crosshill is an area characterized by historic buildings. It is a conservation area, where 89% of the buildings were constructed before 1919, compared to 20% for Scotland as a whole (Scotland's Census, 2011). The study therefore allows us to explore issues around conservation and retrofit and the relations of householders with the agencies concerned.

Third, the area has above average household income, of £807 per week. It also has a middling rank in terms of social deprivation. With the three data zones covering the area identified as within the 4th, 3rd and 7th deciles in the Scottish Index of Multiple Deprivation (SIMD, 2020).

Fourth, despite its above average household income and middling rank in indices of poverty, it represents one of the most fuel poor areas in Glasgow, with 35% living in fuel poverty, 10 percentage points higher than the Scottish or Glasgow figures (each 25%) (Astrosat, 2021).[10]

Fifth, the area is characterized by a variety of tenure; while 61% of homes are owner occupied - slightly lower than the Scottish average (64%) but well above the average for Glasgow (47%) - there are just under three times the number of private rented properties in Crosshill (32%) compared to Scotland (11%) and double the number for Glasgow (16%). Social renting - where the landlord is a regulated, not-for-profit housing association - is relatively low (4%) in comparison to Glasgow (36%) or Scotland (24%).

Crosshill was identified as an area for research for the following reasons. Its large numbers of owner-occupier and a middling rank in deprivation indices suggested broad range of 'able to pay' householders could be identified for interview. The high level of private renting and fuel poverty in the area presented opportunities to explore how relations with neighbours around retrofit were shaped or complicated by tenure and social class within buildings. With a high number of historic tenements that require substantial energy efficiency improvements (Crosshill has below average SAP ratings[11] at 57.78 compared to both Glasgow (68.24) and Scotland (66.01)), it was assumed interviewees may have an interest in and insightful views on retrofit. In addition, the choice of case study area was influenced by the fact that one of the research partners for the project - a sustainability charity - operates in this area and would assist with recruitment of interviewees.

A full description of the general methodological approach to this work is offered elsewhere (Middlemiss et al., 2024). Data was gathered through 11 semi-structured interviews with owner-occupiers which took place between September and December 2021. Multiple recruitment methods were utilised to attract a sufficient number of interviewees. Recruitment efforts included the identification of community Facebook pages, where page moderators were requested to share the research flyer. The local project partner was also asked to disseminate the flyer through its social media feed. Posters were placed on doors along the streets of the case study area, and, where access to communal closes was available, flyers were distributed through doors. Interviewees were recruited where they self-identified as having undertaken significant renovations within the last 5 years, ensuring the information was as current as possible and assuming that interviewees could recall more detailed accounts of recent renovations. While some interviewees had engaged in energy efficiency work the recruitment targeted individuals who had performed a variety of renovations, not solely focused on energy efficiency. This strategy was adopted for multiple reasons.

Firstly, there was an interest in understanding how social relations impact the decision-making process regarding whether to undertake retrofitting or not. Secondly, the aim was to gather insights from homeowners who might not be actively engaged in environmental efforts, recognising that the widespread adoption of energy efficiency measures relies on engaging the broader population beyond those already committed to environmental causes. Third, currently retrofit typically depends on the same traders who provide other renovation services, to the extent that homeowners tend not to distinguish between these two types of work (Kerr et al., 2018); understanding how relations with these traders help or hinder retrofit is therefore crucial to producing better delivery models. Fourth, by considering retrofit in the context of other types of renovation gave us the opportunity to improve understanding of the emotional, symbolic and strongly social context in which home improvements, including retrofit, occur (Wilson et al., 2015).

The recruitment strategy specifically targeted 'able to pay' households, defined as those that had recently financed their renovations entirely or in part by themselves. Therefore, households whose renovations had been fully funded by grants were excluded from the interviewee pool. Interviews were conducted with 11 householders residing in various types of 19th century tenement: three in 'split villas', characterised by a townhouse converted into horizontally positioned flats, and eight in traditional sandstone tenements comprising three or more floors (see Appendix A). This approach facilitated an exploration of the variations in social relations across different tenement types. The focus on owner-occupiers aimed to engage directly with decision-makers and was partly chosen due to the relative difficulties associated with contacting landlords.[12]

[10] Figures are adapted to correspond to the Scottish definition of fuel poverty. Note, the Scottish definition of fuel poverty differs from that of the UK. Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act 2019 provides a 2 part definition: "a household is considered fuel poor if: after housing costs have been deducted, more than 10% (20% for extreme fuel poverty) of their net income is required to pay for their reasonable fuel needs; after further adjustments are made to deduct childcare costs and any benefits received for a disability or care need, their remaining income is insufficient to maintain an acceptable standard of living, defined as being at least 90% of the UK Minimum Income Standard (MIS)" (Scottish Government, 2021b).

[11] Standard Assessment Procedure (SAP) is methodology, which underpins the Energy Performance Certificate (EPC) (UK Government, 2022).

[12] Note, some of the interviewees were also or had been landlords (i.e. HH6; HH9; HH10).

Prior to the interviews, all interviewees were requested to complete a short questionnaire to provide details regarding their household, building type, income, etc. This process facilitated acquisition of background information about the interviewees and allowed the screening of interviews for eligibility.

All interviews were recorded and transcripts produced. Analysis was structured using a modified form of the three types of social relations developed by (Hargreaves and Middlemiss, 2020). First, we consider only two of these types of social relations, namely 1) relations of intimacy and 2) relations with agencies. Second, for relations of intimacy we focus on the particular relations our literature review revealed as of greatest significance in MoPs: relations with neighbours. Third, we also included emergent themes, for example how neighbourly relations are affected by tenure and varying income in a building. Fourth, for relations with agencies (see Table 1), we focus on agencies particular to MoPs' governance, such as owners' associations and property managers (factors). Fifth, we also consider the agencies of local government and national government which emerged from our data as significant for the successful delivery of renovation works in the pre-1919 buildings in our case study.

4. Results and analysis

4.1. Relations with neighbours

This section addresses relations of intimacy, focusing specifically on interpersonal relations with neighbours. It first describes how relations with neighbours support renovation efforts before turning to how they can inhibit such endeavours.

4.1.1. Neighbourly relations as a potential facilitator of renovation work in MoPs

There are positive aspects of social relations within tenements that help to facilitate works. Building type can help forge a bond between neighbours. In part, this is because of the frequency of contact. For example, relations or even friendships are more likely to form with people with whom you are in frequent contact: 'it's about the people who are more … visible' (HH8). In particular, the common areas of tenements, especially stairways, provide a common space where neighbours interact. With heightened neighbourly interactions there are potentially greater resources available to support renovation. This might be some friendly support, such as the neighbours who insisted on cooking for HH8's household when their kitchen was being refurbished. Other support includes neighbours forming alliances to develop renovation plans and coax other neighbours to upgrading communal/shared space (HH3; HH4; HH7). MoPs may also support the sharing of renovation advice. As HH10 explains, he went to 'people in the block' because they 'had experience, not just locally but within this specific building', which meant that 'they might know something that we don't' about barriers to and opportunities for works.

Sometimes neighbours provide invaluable sources of contacts. Glasgow City Council works in communal areas of a tenement block were aided by an architect friend of a neighbour of HH3. The architect had gone through a similar process with the council in his own block of flats and was prepared to use his experience and knowledge in support of HH3 and HH3's neighbours; he 'ended up being effectively … the overall project manager for [the project] on behalf [of the owners]'. Similarly, HH7 reports that one owner of a neighbouring flat, who she describes as 'a secret … multi-millionaire' (he owns one of the flats in the close, the shop across the street, and many other local properties) and also is 'really good about tradespeople', allowed HH7 to draw on his network of traders. If HH3 or HH7 lived in a building with fewer occupants it is less likely that they would ever have benefited from these important contacts.

4.1.2. Relations with neighbours: how do they inhibit renovation?

On the other hand, there are negative aspects of neighbourly relations in MoPs that inhibit works. Renovations can aggravate tensions between neighbours with the result that more relational work is required to maintain neighbourly harmony. HH4 set her DIY home improvements to times best suited to neighbours, doing the 'quieter stuff' in the evenings while louder work was undertaken during the day or at the weekends; a strategy she believed meant that she had avoided complaints about noise. However, HH4 explains that at one point, her taxi driver neighbour, who 'was working night shifts', was 'on my case all the time' about daytime weekend noise. This led to HH4 opting for a more expensive but less noisy option, at which point the taxi driver 'sodded off on holiday for two weeks when I could have done it' without telling her; 'I was livid' she explained.

Renovations also risk causing friction through damage to other's property. The same householder explained how flooding caused by plumbing work in her flat caused damage downstairs. She has had to pay for damage to the downstairs neighbours' properties on several occasions. Compared to a house, she says, 'if something leaks in a flat, it's a whole different bunch of consequences'. When there is a higher risk of damaging others' properties or when others' properties are damaged, more potentially difficult relational work (as well as financial compensation) is required to maintain positive relations. When work takes place in areas of communal responsibility there are still greater demands for relational work, particularly for negotiating payment for communal works. HH6 explains how he has led on costly work to renovate communal areas of the tenements, such as the roof. He says he spent a year 'trying to extract' monies from residents. He admits 'I'm not popular I must say'. A whole building approach is particularly problematic because collective action is a particular barrier to renovation to the extent that outside help might be needed (e.g. HH5; HH7; HH8; HH10; HH11). For example, HH8 suggested that, for tenements, zero carbon heating will require 'a communal solution and that needs to come from the top down rather than potentially just a suggestion from one resident'.

Issues of tenure complicate relations with neighbours further. HH10 explains how it has been fruitless to discuss roof insulation with the tenants because the 'people upstairs … who are living in the flats have [no] great interest in getting it done'. Where there are let properties in an MoP, tenants may even obstruct works. HH3 evicted a tenant, one she described as being a friend, because she repeatedly refused to give builders access to the roof.

On the other hand, private landlords are in a position to block work on renovation. HH7 explained how a landlord of a flat occupied by drug dealers, whose activity was leading to vandalism and other disturbances in the close, only intervened when, at the behest of HH7, regulatory action was taken such that he could no longer receive rent from the tenants as a result of the illegal trade being undertaken from his flat. Similarly, HH3 told of a landlord 'dragging his feet about putting in money' for structural repairs even though the building would have collapsed had the works not been undertaken. HH4 explains how one landlord in her building has been 'threatening us to the last … saying that he's going to take us to court, and this is a conspiracy' over residents' attempts to employ a factor.

Part of the issue here is absentee landlords, owners of one or more properties who let such properties out to tenants but do not live in the building and may maintain a minimal level of involvement with their property. Such landlords may be 'not accessible at all … in our five years of being here, we've seen one of them once', the interviewee adding 'one of them lives in London' and 'I've never seen' the other (I14). As such, the aforementioned neighbourly bonds, stemming from frequent contact

[9] All figures in the table from the 2011 Census (latest available data at the time of writing) except Fuel Poverty, from AstroSat (2021) and average income from 2018 (Scottish Government, 2020a).

and that can support renovation, are undermined by absentee landlords. In general, the balance between tenants and resident owners in the MoP plays a part in making it easier or more difficult to drive communal works; as HH4 explains 'initially, we had people in the close that were just mainly tenants, not owners. We've now got more [resident] owners than tenants in the close', a change that has made it easier to act collectively.

A further complication inhibiting social relations needed for renovation in MoPs is the differential income of the owners. HH3 reports that she and one other neighbour were the keenest to get communal works done 'partly … because … I'm fine financially and I can put some money towards stopping my house from falling into a hole. Whereas [for] some of the other people in the building, it was much more of a daunting prospect getting that sort of money together'.

4.2. Relations with agencies and communities

4.2.1. Property governance agencies: owners groups and associations

A key agency determining renovation outcomes is the governance structure in the MoP. In our case study, governance of communal areas might be: 1) wholly informal, e.g. being managed by informal relations between owners, or 2) organised by an owners' association.

Wholly informal governance was in place in all tenements where there were only two dwellings positioned horizontally, such as 'split villas' (HH1; HH2; HH11).[13] In these cases the governance arrangements were indistinguishable from interpersonal relations and were often characterized by strong interpersonal ties and/or friendships. Where there were multiple flats in a building, however, informal governance was more complicated. In cases where governance was informal, areas of communal responsibility could become neglected, as HH8 put it, people are 'just burying their head in the sand'. In some cases, as is intimated in the previous sections, informal governance seems to have completely broken down. In such cases, some residents had disengaged from discussions with neighbours and problems were ignored (HH7). In others, stark divisions had emerged between owner-occupiers and landlords and with various factions pitted against others, including some owners' plans being vetoed by other [landlord] owners (HH4). Tenements with fewer dwellings might also face instances of neighbours blocking works, but where there are more owners there are more likely to be objections.

There was one example from our case study of a more formal owners' association. It was formal in the sense that the association holds regular meetings to discuss maintenance and improvement of the communal areas of the building and sourcing money from owners for renovations, rather than being legally incorporated. It was formed and is maintained due to a unique set of circumstances. HH7 explains how the discovery of a homeless woman, who had died of an overdose and was found in the communal back garden, led to the owners coming together to confront the problem of a drug dealer operating out of one of the flats. HH7 says that 'there was a day when [a neighbour] found a dead body outside and that's what kick-started things … And then everybody agreed to start paying' into a maintenance fund managed by the owners' association.

The association was established to address long neglected damage to the building. It is managed by HH7, who has experience of property management and, due to her lifestyle (favouring more spare time over higher income) could devote time to management. It is wholly dependent on her unpaid labour to arrange and source trades. She has even paid for minor works herself and paid upfront for more major works (sums which she borrowed from her mother) before getting repaid by the other owners in the close; she says that owners pay up eventually 'if I did all the work and keep it cheap'. In effect, as well as being an important figure in the owners' association, she is informally doing the work of a property manager on a voluntary (i.e. unpaid) basis.

4.2.2. Property management companies: factors

HH3 says she wanted a factor because 'there is a central responsible organisation'. Factors can initiate work within their maintenance remit with a minimum of relational work for owners. HH10 explains 'the roof got done a few years ago as well but … there was no consultation to that; nobody instigated that within the block. [The factor] came, identified an issue and went up and fixed it' with minimum disruption. But they need not exclude owners who wish to be more proactive; HH6 explains 'I do not accept the factor's recommendation ever', and deliberates with co-owners in sourcing traders.

Factors not only reduce owners' relational work by providing a one-stop-shop for residents to get maintenance work done. They also relieve neighbours of the potentially fraught relational work involved in gathering funds from fellow owners. Having a 'corporate body' responsible for sourcing money, instead of individual owners, can help smooth neighbourly relations. As HH6 explains:

> 'I've done it in the past, where you approach neighbours directly, and it's not really the way to do things. You know, you bump into your neighbour going into the car and you go … I believe you've not paid your £300 share yet. That's why the factor's there'.

However, the negatives of factoring are considerable. A key complaint is overcharging. HH3 explains how neighbours see factoring as an 'an extra expense' which deters poorer owners from seeking factoring services. HH7 says not only do 'you have to pay their fees' but also a mark-up on any of the work that gets done; she says works undertaken through factors will cost 'at least 50% more'. There was also a concern that some factors do not provide value for money. HH3 admits, 'a lot of the factoring organisations in Glasgow have pretty bad reputations and you hear things about [how] you pay these people … and nothing ever happens … Pretty much all of my friends who live here have had issues with their factors'.

Partly because of negative attitudes towards factors, when there is not already a factor in place it can be challenging to organize within the close to appoint one; HH3 was relieved that in their close they were forced into getting a factor as a condition of receiving support from the council for structural works because 'it meant that we didn't have to persuade the people in the building who were … less keen'. However, factors themselves may reject offers to be appointed where it might mean taking on potentially challenging relational work. Legally - and typically contractually - a simple majority of owners can decide on factoring arrangements. However, in practice factors are reluctant to take on a property where there is any disagreement about contracting factor services. As HH4 explains 'no factor would take us [on], with less than a 100% of the owners' agreeing to be factored, meaning that one landlord has been able to repeatedly block attempts to get a factor for 10 years; the factors 'don't want the trouble. If you've got somebody you know you're going to have to take to court, you know you're going to have to chase money in the block'.

Owners' associations may exist at the same time as factors, for example HH6 held regular meetings with owners despite having a factor. This appears to have been a successful combination, constituting the only example of major works being undertaken on communal areas of the building that were led by residents. However, in this case HH6 took responsibility for managing the relational work, providing strong leadership which supported active engagement by owners. Where this is absent there may be problems. As the factor takes on the formal duties of both enforcing payment and (typically) managing works, their presence reduces the need for frequent contact between owners (as HH10 indicates above). Put simply, owners' associations will not meet frequently if it is thought that there is nothing for them to do. In which case, effective factoring may paradoxically undermine the imperative for relational work and the strength of social relations between neighbours that are necessary for collective works outwith the remit of factors, such

[13] A detached or semi-detached townhouse which has been separated into two more flats.

as building improvement or energy retrofit.

4.2.3. Local government

Local government is an often mentioned actor in renovation. Glasgow City Council is mentioned for the impact of its conservation role in affecting renovations. HH11 notes that regulations on insulation restrict its use on his building. Most commonly householders were deterred from window replacements because of conservation rules (HH1; HH2; HH3; HH4; HH10; HH11). The time taken for permission to be given for interventions is criticized. Some owners are not prepared to wait, as HH10 explains: 'Our neighbours … have had a bit of a fight at times ... to the point that one of the neighbours just did it and, kind of, I'll take the consequences of that afterwards'. Conservation rules applied to old buildings - and their cost implications - were also a problem shared across building types. For example, homeowners explain that the costs of the required timber sash-and-case windows have deterred window replacement.

The interviewees highlight how Glasgow City Council has been crucial in prompting renovation works in areas of communal responsibility in tenements (HH3; HH8). The council have instigated works essential for the maintenance of the long term structural integrity of buildings, such as subsidence, damp proofing, roof repairs, pointing and fixing exterior supporting walls. In the two cases from our case study, the work is very costly (e.g. HH3's share of the cost of works to prevent subsidence was £25 000) and owners have struggled to realize the projects without outside intervention. The owners were not even aware of the extent of the problems without the detailed assessment of the property provided by the council. As HH3 explains:

> 'Once we found out quite how bad the subsidence was and quite how possibly dangerous the situation was with it, maybe just being about to fall down … I don't know how we would have ever found that out if we hadn't started the process.'

In both cases, the council contacted all of the owners outlining the need for repairs and arranged meetings to discuss. In both cases there were also threats, of compulsory repairs orders being made (HH8) or 'mandatory eviction' (HH3). In both cases the council offered to provide means tested financial support to owners, of up to 50% of the value of the works, if they chose to accept the works proposed under the council's repairs programme. The council also insisted on unanimity amongst owners if the works were to proceed and the appointment of a factor to address ongoing maintenance (none were in place at either location).

The council's interventions appear to have been particularly effective for galvanising owners. Admittedly, the project still involved considerable relational work amongst owners. HH3, as noted above, complained about landowners dragging their feet over making payments. Few owners attended the meetings arranged by the council (HH3; HH8). And despite the seriousness of the situation, owners were sometimes still difficult to engage with. HH8 says it is 'frustrating' that:

> 'People are, for whatever reason, not really that great to communicate with. Like, people are … oh I don't ever look at my emails … don't get messages on WhatsApp … it means everything takes ages'.

Yet the combination of threats and benefits seems to have played a pivotal role in driving MoP renovations. As HH8 explained, 'now that the council are saying they might go to compulsory repairs, everyone's like, let's quickly do something … 'cause it's probably going to end up costing us a lot more money [if we do it independently of council support]'.

While HH8's building works were not yet finalized at the time of the interview, HH3's have been completed. HH3 explains how now, having accepted the offer, owners have little further say in the works; the council and its teams assessed the building, created a 'list of all of the things that needed doing' (HH3), arranged all of the contractors and delivered the project. They also set the timing: 'we were just at the whim of the council … we had no say on who was contracted or indeed about the timeline' (HH3). Moreover, she explained how the maintenance works were poorly coordinated with retrofit interventions. Prior to the structural works on the building, HH3 had accessed a government scheme to provide insulation in the roofspace. When the structural work was completed 'they pulled all of that insulation out'. Nonetheless, HH3 is 'glad' the works were done; considering the difficulty that remained in mobilising owners even after the project was instigated by the council, it is unlikely that the works would have been undertaken without the intervention.

4.2.4. Government funding and advice for renovation

Apart from local government, the state and its agencies provide grant support for renovations. This may be particularly important in conservation areas where there are considerable costs to renovating buildings and government support helps to make projects affordable.

Several interviewees have sought government funds dedicated to renovations (HH4; HH6; HH7). HH6 received payment of 30% of the cost of a new roof because it was for a B listed building. Yet there is some scepticism about the funding available to owners. Sometimes getting grants does not make renovations more affordable. HH6 explains:

> 'In order to qualify for the grant we had to use traditional materials because it's a property of interest, i.e. listed, so we had to use [specialized materials] which of course are more expensive, so [it's] a false economy getting the 30% grant because we were going for the top end price' (HH6).

Similarly, to fix the balustrade for HH7, the council offered 50% towards the payment if undertaken by council sourced suppliers. However, HH7 found the price, at £17k, too expensive and the waiting times too long. She got the price down to £3k from sourcing traders through her networks in the community; so they forwent the council money because 'it was a lot cheaper doing it how we did it with local contacts'.

Interestingly, not one of the householders was familiar with Home Energy Scotland, the agency tasked with delivering retrofit across Scotland through information and guidance but also administering energy efficiency assessments, grants and interest free loans (HES, 2023).

5. Discussion

In this paper, we have invistigated what are the key social relations of the 'able to pay' dwellers of tenements in our case study area of Glasgow and how these help and hinder retrofit. We have laid out the key social relations, with 1) neighbours, 2) owners' associations, 3) property managers and 4) government. In this final section four key findings are highlighted, explaining how these types of social relations help and hinder renovation works, emphasising the implications for retrofit. We then outline areas for future research before finishing with a discussion of the implications of our work for policy and practice.

5.1. Key findings

5.1.1. Retrofit in MoPs involves more relational work

Previous work has indicated that close quarters living can lead to strained relations between co-owners of a building (McCarthy and Saegert, 1978; Power, 2015; Thomas et al., 2011). Our findings go beyond extant literature by showing the consequences for renovations work and, by implication, retrofit. Our social relations lens sheds light on how achieving retrofit in MoPs involves more relational work than in other building types. Significantly for our argument, the sharing of information about plans, timings and scope of work are influenced by the desire to keep neighbours 'on side', cater for neighbours' preferences and minimise disruption, demonstrating a considerable concern for neighbourly relations.

Our findings also go beyond existing literature by highlighting two key factors which complicate relational work for retrofit in MoPs. First is the spectrum of wealth within MoPs. While some residents are able to afford renovations, others are not. Legal scholarship shows how laws of

association relating to MoPs allow a household to veto renovations proposed by a majority of owners in a building (Weatherall et al., 2018). Low-income households, then, have the ability and motivation to block retrofit works- proposed by the 'able to pay'. However, in highlighting the social relations within the building between the able and unable to pay, our findings go beyond the existing focus on the procedural rules around MoP governance, showing how issues of fairness and justice form a key part of discussions on the processes around governance and how they affect renovation, involving difficult conversations and (as in one example from our case study) provoking resentment from those feeling unsympathetically or unfairly treated. Our work, then, sheds new light on how the prospects for energy efficiency of the 'able to pay' in MoPs are tied to the prospects of the 'unable to pay'.

Second concerns absentee landlords. Extant literature shows how 'split incentives' between landlords and tenants provide a barrier to retrofit in properties (Bird and Hernández, 2012). In our findings, our relational lens aids us in identifying an additional barrier to retrofit concerning absentee landlordism; absentee landlords disrupt patterns of neighbourly social relations in MoPs, as their absence reduces or eliminates opportunities for the required interaction amongst decision-makers to build the trust that enables renovations.

5.1.2. The challenging balance between grassroots action and professional management

On the other hand, our findings suggest promise for grassroots retrofit action in MoPs. Owing to their size and the presence of multiple residents, MoPs, as is noted elsewhere (Skjaeveland and Garling, 1997), allow residents to draw on larger networks of support. In our case study we have shown how this has served to source advice and build alliances to enable renovations.

Our findings also cover new ground in showing how relationships with professional property managers affect opportunities for grassroots action. Previous research has shown how grassroots action in MoPs depends on the leadership skills present in a building (McCarthy et al., 2018). What our findings also suggest is that the extent of relational work involved in managing relations between co-owners and traders, means that the necessary leadership within a building is undertaken by those who have not just the appropriate skills but the available time, resources and willingness to undertake it. Because this fortuitous combination of skills, resources and time will rarely be present, resident-driven retrofit is a challenge. In such cases, hiring someone (such as a contractor or a property manager) to provide a leadership role would seem to offer a potential solution; our findings illustrate how property managers provide the advantage of offering a 'one-stop-shop', effectively allowing homeowners to outsource the relational work of building maintenance.

Unfortunately, however, our case study is in agreement with Robertson (2019), showing that relations with property managers in Scotland are marred by mistrust. Our findings, then, also chime with previous research which has shown how issues of trust in commercial operators, such as traders, inhibit retrofit (Hargreaves and Middlemiss, 2020; Novikova et al., 2011). Yet in our case, being so fundamental to the maintenance arrangements of many MoPs, property managers provide an additional barrier of mistrust for owners in MoPs; in MoPs traders who are mistrusted are often sourced by property managers who are also mistrusted. Such an arrangement is unlikely to be conducive to the widespread uptake of intrusive and often costly measures required of retrofit in MoPs. Moving beyond the issue of trust in property management, however, another novel finding of our research is that the presence of property managers undermine grassroots action. Our findings show how, because much of the relational work of MoP governance (e.g. communications between owners, managing traders) is outsourced to property managers, property managers reduce the necessity for frequent contact between neighbours. Whilst in other countries such tasks are undertaken by owners' associations, which create the fora for frequent contact between co-owners and which builds the basis for collective action (Pink, 2004), in our case property managers undertake works with 'no consultation' (I10), where owners become recast as passive recipients of maintenance services. Such an arrangement leads to a cycle of decline and repair rather than proactive engagement for improvement of the building. In our conclusion (Section 6) we suggest how a better balance between grassroots action and professional property management might be achieved.

5.1.3. The absence of regulatory support inhibits retrofit

Our research provides insights into the relationship between social relations and law proposed by Block (2013). Legal scholarship has considered how legislation establishing rules of governance in MoPs presents a potential barrier to retrofit (Weatherall et al., 2018). In our case study, by deploying a relational lens, we show how the challenges go beyond issues of formal decision-making. We demonstrate how the impacts on owners of inadequate legislation results in too much relational work of owners. Without clear governance rules, householders in MoPs are on their own; they must start largely from scratch to establish the rules of the relations with fellow building dwellers, on an ongoing basis as circumstances change, which will often be in reaction to challenging circumstances such as major emergency repairs. The extent of the difficulty is such that owners in MoPs are prepared to outsource much of the relational work to commercial property managers despite concerns, as we have seen, that they overcharge and underperform. Our work, thus, provides empirical support for the theoretical arguments of Block, (2013), that the law provides an important source of support for relational work, in our case by illustrating how its inadequacy leaves owners bereft of adequate support.

5.1.4. A key role for the state and state agencies in MoP retrofit

Previous research has shown how local government in the UK is a potentially powerful delivery partner for energy efficiency (C.A.G Consultants, 2011; Wade et al., 2022). Moreover, local authority-led area--based approaches in particular, which target neighbourhoods one-by-one, have had some success in delivering and mobilising action for retrofit for difficult-to-treat properties in areas of fuel poverty (C.A.G Consultants, 2011; Vatougiou et al., 2020). We also note that major interventions, including district heating programmes are a challenge to be delivered bottom up (van der Schoor and van der Windt, 2023). In our study, we see the need for 'top down' interventions reflected in the limitations residents recognise in their own ability to drive major interventions such as district heating, considering them as unrealistic to be delivered bottom up, either by individuals or even groups of residents.

Moreover, our research builds on (but goes beyond) earlier work by showing how 'top down' approaches also have particular relevance for the 'able to pay' in MoPs. Interviewees' experiences of Glasgow City Council's role as initiator, facilitator and delivery partner for essential maintenance works in tenements is illustrative of how a council-led approach to retrofit for the 'able to pay' could be organised. From our case study it is clear that the success of this model can be accounted for by the fact that the council is uniquely placed - as a resourced, legitimate and trusted agency. A local authority is able to use the stick of compulsory works and the carrot of (means tested) financial support to deliver agreement amongst homeowners, including absentee landlords and low-income owners. The experience of our interviewees shows how difficult it has been to mobilise owners even in cases where failing to act may result in building collapse. Where the threat of collapse is absent, for example, when the motivaiton for interventions is improving energy efficiency, it is likely that the need for top down intervention is even more pressing.

Our exploration of the social relations between homeowners and agencies also highlights some other novel aspects. In our case study area communication flows between state agencies and owners were often poor; lack of transparency of conservation and planning rules and processes inhibited owners' renovation plans while knowledge of financial support packages, e.g. from Home Energy Scotland, had not penetrated the interpersonal relational webs we found in our case study.

5.2. Future research

A key contribution of this work is to apply the social relations lens (Hargreaves and Middlemiss, 2020; Zelizer, 2012) to the question of retrofit in MoPs, as a setting for numerous and often complex relationships. Future research might usefully concentrate on developing greater understanding of how relational factors can galvanise residents to get work done in MoPs. For example, it might investigate incidences in which residents have undertaken major works successfully without these being instigated by local government, or other outside actors, and explore common factors that led to that success. Case studies of successful resident-led whole building retrofits might be particularly insightful.

While our findings support Block (2013) on the benefit of law in supporting relational work, more work is required to better conceptualize the relationship between social relations and procedural (or legal) rules. For example, social relational analysis may have some promise in helping us to better understand what makes a law designed to encourage retrofit effective or not. It can help us investigate how social relations shape understanding, acceptance or rejection of the legal or procedural rules involved. It might also be used to explore how governance arrangements to ensure successful retrofit in MoPs, such as through a study that draws on international comparisons, create the best balance between relations of intimacy (between neighbours) and relations with agencies (with property managers).

Finally, while we are confident that the insights that emerged from our case studies will be familiar to many owners in MoPs, we recognise ours was a case study of a small area in one Scottish city. Replicating the study in other areas with similar and varying demographics or a more extensive approach (e.g. using a widely distributed survey to MoP owners) would help to further substantiate the generalisability of our findings.

6. Conclusion and policy implications

Without dramatically reducing carbon emissions from the UK's domestic properties it will not be possible to deliver on net-zero housing targets. Furthermore, without accelerating retrofit of MoPs it will not be possible to deliver net-zero in domestic properties for the 46% of Europe's population who live in flats today.

Domestic energy efficiency policy in the UK is failing (CCC, 2022). UK retrofit programmes, which have predominantly deployed individual financial incentives, have achieved only disappointing results (HoC Environmental Audit Committee, 2021; Rosenow and Eyre, 2016). In this paper we have argued that an approach which is attentive to the social relations between households and their wider social network is better placed to deliver retrofit, particularly in MoPs because of the collective decision-making processes demanded of such buildings.

Drawing on Zelizer's concept of 'relational work' and deploying two of Hargreaves and Middlemiss' three types of social relations (i.e. intimacy and institutions) as an analytical framework, the case study of owners in historic MoPs in Glasgow has provided a number of key insights. We find that the increased relational work required to manage the relations between co-owners (e.g. to avoid conflict over disruption or negotiate payment for collective works) provides a potential barrier to retrofit. Yet, on the other hand, MoPs are a potential treasure trove of relational resources for retrofit; residents stand ready to support one another, spread knowledge and demonstrate leadership. How, then, do we overcome the relational obstacles to retrofit and tap into the relational resources to deliver it more effectively?

Our research highlights two key interrelated aspects. First, governance. Our findings agree with Block (2013) who highlights the importance of regulation to support relational work. It is found that the absence of mandatory owners' associations equipped with formal rules of governance and collective responsibility leaves owners without sufficient guidance on how to relate to neighbours or property managers over building maintenance. Nor does it provide sufficient protection for owners to lead energy efficiency improvements. As such, a lack of regulation to support the relational work around retrofit in MoPs acts as a barrier to demand for retrofit from MoPs.

The second aspect concerns the underappreciated relational role of property managers or 'factors'. We show how property managers are a potentially powerful ally for owners, easing communications with co-owners and managing the challenging relational work of appointing and overseeing contractors to deliver renovations in communal areas of buildings. However, distrust of property managers is such that it makes owners reluctant to access property managers' services or have confidence in their proposals. And where property managers provide effective maintenance services, this can serve to undermine the relational work supportive of building the relational resources amongst neighbours required to drive retrofit from below.

Hence, in our case study we detail where the social relations required for the growth of an important sector for a transitioning economy are dysfunctional; by shedding light on the relationship between law, governance and social relations, we show how decarbonisation of our building stock is being stymied by an absence of regulatory support for relational work. The implications of our findings are that regulation that supports relational work within MoPs, e.g. creating carefully designed mandatory owners' associations, supported by transparent and accountable property management services, will provide better support for retrofit in MoPs and, as a result, the retrofit industry more broadly. In Scotland, amendments to governance provisions for MoPs that could be legislated in the aftermath of the work of the Scottish Law Commission, 2024 (see Section 2.2) should be enacted as a matter of urgency; progress towards energy efficiency in MoPs will be a challenge without compulsory owners' associations established as a legal requirement for MoPs. In the meantime, local authorities could make the formation of an owners' association a condition for receiving support from council's critical repair programme and other such programmes, instead of merely the appointment of a property manager. We should note that in this regard the implications apply to the rest of the UK too, which shares with Scotland a lack of properly established owners' associations.

The research indicates that merely establishing compulsory owners' associations will not suffice to achieve retrofitting in MoPs. Assigning property managers (factors) the responsibility for not only maintaining buildings but also for meeting acceptable standards of energy efficiency could prove beneficial. With adequate support, these managers could develop the necessary knowledge and expertise to deliver this outcome for owners' associations. From a relational perspective, legislation that holds factors accountable for building energy efficiency offers significant opportunity in the context of MoPs. Instead of government agencies having to address the 36% of households who live in flatted accommodation they could save considerable resources by targeting their interventions at the 357 property factors operating in Scotland.[14] However, as our research shows, trust in property managers is not a given and their presence potentially undermines owner engagement. An approach, then, that is over reliant on factors, risks provoking resistance to retrofit in MoPs.

For factors to take a greater role in retrofit reform to ensure trust and encourage owner participation is required. One approach to establish trust could be a requirement established in legislation for property managers to take the legal form of a consumer cooperative. Due to the perception that cooperatives are more ethical and because of their democratic control by members, cooperatives tend to be more trusted than commercial firms (Co-operatives UK, 2021; Ole Borgen, 2001; Sommer, 1991; Talonen et al., 2016). In the case of property management, consumer cooperatives would seem to be a good option because such an association would allow all householders served by the company

[14] As of 15/2023, personal correspondence for the Property Factors Register of Scotland on the 16th of February 2023.

to become members, allowing all owners to attend AGMs and scrutinize company accounts. To encourage owner participation, much might be learned from the experience of property governance arrangements in other countries. For example, in Spain governance regulations seek to create a balance between owner engagement and professional administration, with trust established through strict regulation and regular, professionally managed, in-person meetings between owners and the property manager (SpainExpat, 2022). To illustrate, Spanish owners' associations are responsible for fixing the budget, sourcing funds form co-owners and establishing rules of behaviour. This work is supported by a qualified estate administrator, who arranges and attends all association meetings, manages bank accounts and ensures legal compliance. In this way the different roles and duties of the owners and estate manager are both substantive and clear, as is how they support one another; the owners' association sets the direction and the estates manager addresses technical aspects of procedure, administration and procurement.

While reform of property management and governance would provide an improvement on current arrangements, there remain the aforementioned challenges regarding varying tenure and income inequality in MoPs. The existing exclusive rights afforded to absentee landlords in building governance are problematic where a long-term tenant may have a greater interest in the building and the community which surrounds it than the landlord. Measures such as allowing long-term tenants (e.g. who have rented a property for 2 years or more) to exercise votes in building governance where landlords are non-contactable or insisting upon agreement between owner and tenant if the vote of the owner is to be counted would: 1) allow those most badly effected by neglect of energy efficiency to have a voice; 2) encourage landlords to be more attentive to tenants energy needs; and 3) ease the governance of buildings by making it more likely that decision-makers will be accessible.

Turning to income inequality, an approach that makes differential support available for owners of different means, such as already undertaken in Glasgow through their essential repairs programmes and Area Based Schemes for energy efficiency, has proved effective for maintenance schemes and would seem appropriate for retrofit schemes too.[15]

However, financial support must also be a component of any retrofit initiative in historic MoPs, extending beyond those deemed unable to pay. Conservation regulations placed on owners, along with the challenges of retrofitting difficult-to-treat properties, render retrofitting prohibitively expensive. Additionally, insufficient governance arrangements, leading to tenement neglect, represent a political failure; the historic neglect of tenements is mainly the result of political decisions at the government level rather than the responsibility of MoPs owners. Therefore, a compelling argument exists that owners should not be solely responsible for bearing the full costs of transition. Key measures significantly impacting energy efficiency encompass enhanced financial support for specialized double (or triple) glazing required in conservation areas, along with insulation for both outer and inner walls. Given that the costs and scale of such projects surpass the capacities of any single owners' association, there is a compelling case in densely populated areas for 'top-down' interventions by local government. Such interventions would involve constructing and implementing district heating systems for tenements. Initiatives undertaken by Glasgow City Council in the case study demonstrated high effectiveness in fostering community engagement and uniting owners to ensure the successful executions of projects. The capacity of a local authority to deliver retrofit projects needs strengthening, and its ongoing programme for essential repairs should be integrated with its retrofit strategies.

The delivery of this work would be much improved if properly functioning owners' associations were also in place to coordinate with local authorities the payment, timetable and scope of such works. The approach we propose, then, combines elements of 'top down' and 'bottom up', eschewing the failed model based on individual incentives (HoC Environmental Audit Committee, 2021; Rosenow and Eyre, 2016) and building the institutions and capacity for a collaborative approach, capable of driving far greater uptake of energy efficiency in historic MoPs.

CRediT authorship contribution statement

Iain Cairns: Conceptualization, Formal analysis, Investigation, Methodology, Validation, Writing – original draft, Writing – review & editing. **M. Hannon:** Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Writing – original draft, Writing – review & editing. **A. Owen:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Resources, Software, Validation, Writing – original draft, Writing – review & editing. **R. Bookbinder:** Validation, Writing – original draft, Writing – review & editing. **M.-C. Brisbois:** Project administration, Validation, Writing – original draft, Writing – review & editing. **D. Brown:** Conceptualization, Funding acquisition, Methodology, Project administration, Validation, Visualization, Writing – original draft, Writing – review & editing. **M. Davis:** Conceptualization, Funding acquisition, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing. **L. Middlemiss:** Conceptualization, Funding acquisition, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing. **G.M. Mininni:** Validation, Visualization, Writing – original draft, Writing – review & editing. **M. Combe:** Conceptualization, Resources, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of competing interest

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

Data availability

The data that has been used is confidential.

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[15] We should note that Area Based Schemes of energy efficiency already operate on this basis.

Appendix A. List of Householder Interviewees

Interviewee	Gender	Street	House type	Age	Household (a = adult; c = child)	Education	Employment status	Job	Income	Intervention
HH1	F	QMA	Tenement Flat (split villa)	70+	1a	Degree or equivalent	Retired	n/a	£25 000 to £35 000	Bathroom refit
HH2	F	QMA	Tenement Flat (split villa)	50–59	2a, 1c	Degree or equivalent	Working Full Time	Journalist	> £55 000	New boiler
HH3	F	QMA	Tenement flat	40–49	1a	Degree or equivalent	Working Part Time	Humanitarian education specialist, working part time and also consulting part time	£ 35 000 to £45 000	Structural repairs to building, kitchen refit
HH4	F	Albert Road	Tenement flat	50–59	2a	Degree or equivalent	Working Full Time	Postgraduate Admin Officer in Further Education sector	£15 000 to £25 000	New heating system, considerable redecoration.
HH5	F	Albert Road	Tenement flat	60–69	1a	Degree or equivalent	Self Employed	Film Director/ producer	£15 000 to £25 00	Bathroom refit
HH6	M	Queen's Drive	Tenement Flat	50–59	2a	No qualification	Part Time	Hairdresser	> £55 000	New roof, new windows, other.
HH7	F	Albert Road	Tenement flat	50–59	1a	GCSE grades A*-C or equivalent (O levels)	Unpaid Family worker (carer or parent) Unemployed Voluntary worker	Clothes maker; property manager/ holiday manager; living off mother; rent	< under £10 000 (asset rich - half owns two houses - cash poor)	Stairwell repairs
HH8	F	Albert Road	Tenement (main door) flat	30–39	2a 1c	Degree or equivalent	Working Full Time	Film/TV Producer	£35 000 to £45 000	New kitchen
HH9	M	Albert Road	Tenement Flat	30–39	1a	Degree or equivalent	Currently unemployed	Marine Engineer	£45 000 to £55 000	New lightbulbs, and digital thermostat
HH10	M	Albert Road	Tenement Flat	30–39	2a	Degree or equivalent	Full Time	PhD student; Research Assistant; Tutor	>55 000	New Boiler
HH11	M	Albert Road	Tenement Flat (split villa)	40–49	2a 2c	Degree or equivalent	Full Time	Housing Officer	£25 000 to £35 000	Roof space extension

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