



# The Role of Neighbourly Relations and Cooperation in Residents' Willingness to Renovate Multi-Family Buildings in Croatia

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**Abstract:** *The inadequate legislation on multi-family housing management in Central and Eastern European post-socialist countries calls for the exploration of additional determinants of building renovation on the level of the community of residents in a building. To this end, we present here an analytical framework called the mediated-Renovation Decision (m-RD) model for simultaneously testing the direct and indirect effects that neighbourly relations, cooperation of the co-owners' representative with the co-owners, and acceptance of the building co-ownership concept have on co-owners' willingness to invest in building renovation. The model is based on assessments made by 325 co-owners' representatives from multi-family buildings in Croatia. The results show that the quality of neighbourly relations affects the co-owner's willingness to renovate not directly, but indirectly through the level of their acceptance of the building co-ownership concept. The other indirect effect of neighbourly relations – through the level of the representative's cooperation with co-owners – was not significant. The demonstrated analytical value of the m-RD model advocates for more complex studies of the role of neighbourly relations in collective decision-making and actions in the housing domain.*

**Keywords:** neighbourly relations and cooperation; multi-family building renovation; collective decision-making and actions; mediation analysis.



## Introduction

The need for the renovation of the urban housing stock across post-socialist European countries, including Croatia, and the multiple factors that led to this condition are well documented (for an overview, see, e.g. Cirman et al. 2013; Pojani and Baar 2016). From a legal perspective, the mass privatisation of the state-owned public housing stock in the 1990s (Stephens et al. 2015) emphasised private homeownership rights, but existing legislative frameworks failed to provide a clear definition of individual homeowner duties (Gruis et al. 2009; Ignatova and Rabenhorst 2009; all as cited in: Mandič and Filipovič Hrast 2019). Consequently, difficulties have arisen in the maintenance and management of the common parts of multi-family buildings (e.g. façade or elevators) (Svirčić Gotovac et al. 2021). However, there are few studies on the determinants and models of successful renovation, and even fewer that deal with this issue on a micro-sociological level – for example, on the level of the microcommunity of a building's residents (see Bengtsson 1998; Yau 2010). In multi-family buildings co-owners often express discordant interests in the maintenance and management of common building property (Bengtsson 1998). Thus, in order to successfully manage their common property, co-owners must overcome these internal disagreements through common decision-making and action (Orbán 2006). Such cooperation among co-owners (or the lack of it) could determine the success or failure of the building renovation process, regardless of the specific legal and sociocultural context (Mandič and Filipovič Hrast 2019). Accordingly, a number of authors have highlighted the involvement of co-owners as one of the key determinants of the outcome of a renovation (e.g. Cairns et al. 2023; Cirman et al. 2013; Kearns and Forrest 2000; Middleton et al. 2005; Yau 2010).

Specific components of neighbourly relations and cooperation have already been identified as factors that may help initiate and retain co-owners' participation (e.g. Cairns et al. 2023; Bengtsson 1998; Orbán 2006). One such factor is the sociocultural milieu, which includes people's positive attitudes and commitment to their neighbours and the ability to reach an agreement (Chavis and Wandersman 1990; Cirman et al. 2013; Yau 2010, 2011a; Temkin and Rohe 1998). Another factor refers to shared social norms, values, and beliefs as the prerequisites for co-owners to accept the concept of common property and to act appropriately (Leung 2005; Yau 2010, 2011a, 2011b). A third factor is the co-owners' ability to organise and coordinate common actions in building maintenance and renovations, an ability embodied in their participation in the building management (Cirman et al. 2013; Temkin and Rohe 1998; Yau 2010, 2011a). Thus, the successful day-to-day maintenance and management of buildings, let alone its renovation, depend on the existence of adequate social relations among co-owners, the right attitude toward common property, and a certain level of personal engagement (Wekerle et al. 1980).

However, one problem with previous studies is that, even when the social determinants of renovation were simultaneously measured, the interplay between them was not examined (e.g. Borisova et al. 2014; Cirman et al. 2013; Orbán 2006; Temkin and Rohe 1998; Yau 2010, 2011a). Typically, these variables are introduced into regression models within a single step, so their actual interactions in affecting co-owners' decisions and actions remain unknown.

Therefore, we propose an initial analytical framework – called the mediated-Renovation Decision (m-RD) model – to simultaneously test the theoretically assumed direct, but also indirect, that is, mediated, effects of selected variables (neighbourly relations, cooperation between co-owners and their representative, and the acceptance of the concept of building co-



ownership) on co-owners' decisions about building renovation (see Figure 1). We observed these processes from the perspective of the co-owners' representatives. In the Croatian housing context, the representative is a person – elected by and from among other co-owners – who represents the multi-family building in communication with the building management company. As communicators and coordinators of collective decision-making and actions, representatives have direct insight into social dynamics within their multi-family building and are therefore valuable agents for assessing relations among neighbours and the level of the co-owners' involvement in building management. Accordingly, all the variables in the m-RD model are assessed by representatives.

Within the m-RD model, the co-owners' willingness to invest in building renovation (renovation willingness) is tested as a function of the quality of the co-owners' neighbourly relations (see Figure 1). However, we assume that strong neighbourly relations in the building also favour the co-owners' acceptance of co-ownership responsibilities, which, in turn, predicts renovation willingness. Therefore, the measure of co-owners' acceptance of the concept of common building property co-ownership (co-ownership acceptance) is introduced in the model as the first mediator of the assumed effect of neighbourly relations on renovation willingness. This variable is a counterpart to the dimension of shared values from Yau (2010, 2011a, 2011b) and an aspect that post-socialist authors recognise as problematic for building management (e.g. Cirman et al. 2013; Mandič and Filipovič Hrast 2019). Furthermore, the face-to-face, long-term, and frequent nature of co-owners' mutual relations and the limited scope of the group of neighbours have already been identified as features of neighbourly relations that may induce collective cooperation (Bengtsson 1998). Consequently, collective cooperation acts as a second mediator between neighbourly relations and renovation willingness in the m-RD model. In the current study, collective cooperation is approximated by the representatives' assessment of the quality of the cooperation they have managed to achieve with the co-owners. At the same time, the two mediators are intercorrelated, which turns the m-RD into a parallel multiple mediation effects model (Hayes 2022). Although collective cooperation, through discussions and common actions, should lead to stronger co-ownership acceptance, the opposite is also possible: based on the stronger co-ownership acceptance, co-owners could behave more cooperatively. However, since the currently insufficient theoretical foundations and the transversal nature of our research could not help in resolving the dilemma of a possible causal relationship between these two, but also the other constructs within the m-RD model, a more detailed discussion of these issues is postponed until the concluding sections of the paper.

## Method

### Participants

A sample of 325 representatives (52% females;  $M_{age} = 50$  years;  $SD_{age} = 11$ ) participated in the survey. The majority of participants (63%) were representatives of buildings located in the capital city of Zagreb, while the rest were from other Croatian cities. The median length of participants' residency in the building was 16 years (*range*: 0 – 71) and the median length of the representatives' tenure was 4 years (*range*: 0 – 26). Representatives represented 20 co-owners on average (*range*: 4 – 288), in buildings that were built before 1945 (17%), between 1945 and 1990 (in the socialist period; 56%), and after 1990 (in the post-socialist period; 27%).



## Procedure

An online survey was conducted using the *Limesurvey* system. The participants accessed the questionnaire through a link distributed in the closed Facebook group ‘Co-owners’ Representatives’ administered by an internet portal devoted to housing maintenance and management issues.

## Data analysis

Table 1 presents descriptions of all measures in the m-RD model. Figure 1 shows that neighbourly relations were supposed to influence renovation willingness both directly and indirectly, through co-ownership acceptance and collective cooperation. Therefore, our analysis answers one of the main theoretical questions, which is whether co-ownership acceptance and/or collective cooperation mediate the influence of neighbourly relations. In addition, the level of respondents’ general satisfaction with the building (building satisfaction) was included in the model as a covariate of renovation willingness (Figure 1). This variable was included in the model in order to control for the possible confounding effect of the quality of the building, for which, as it has been shown, the building satisfaction is a good proxy (see Yau 2010: 131)<sup>1</sup>.

The m-RD model was tested using *Mplus 8* (Muthén and Muthén 1998-2017). Since renovation willingness and co-ownership acceptance are ordinal variables, model estimation was done using the weighted least square mean and variance adjusted estimation (WLSMV). Bootstrapping procedures (5,000 resamples) were used to generate 95% bias-corrected confidence intervals (CIs).

## Results

Table 1 presents the descriptive statistics and intercorrelations for the m-RD model variables. All correlations were moderate and significant; at the same time, the coefficients did not indicate the presence of a multicollinearity problem in the dataset.

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<sup>1</sup> Another preconceived covariate, the amount of monthly fee that co-owners pay for building maintenance, which was intended to represent an estimate of the building’s condition and the co-owners’ financial state, had a non-significant zero-order correlation with renovation willingness ( $r = .12, p > .05$ ), so it was excluded from further analyses.



**Table 1: Descriptives and intercorrelations for variables in the mediated-Renovation Decision (m-RD) model**

Variable	1.	2.	3.	4.	Mean	SD
1. renovation willingness					2.15	0.64
2. neighbourly relations	0.34*				3.30	0.70
3. co-ownership acceptance	0.57*	0.40*			1.95	0.52
4. collective cooperation	0.39*	0.59*	0.42*		3.20	0.80
5. building satisfaction	0.32*	0.37*	0.33*	0.38*	3.24	0.80

Note: **renovation willingness** = Are the co-owners willing to invest financial resources in major building repairs/improvements? (1 – Not at all; 2 – Only for necessary repairs / improvements; 3 – For repairs/improvements that are not necessary); **neighbourly relations** = How would you rate interpersonal relationships in the building? (from 1 – Very poor to 5 – Excellent); **co-ownership acceptance** = To what degree do you think most co-owners accept the concept of common ownership in a building? (1 – Not at all: co-owners only care about their private property and completely neglect the care of the common property; 2 – Partially accept: co-owners primarily take care of their private property, and they take care of the common property only as much as they have to; 3 – Fully accept: co-owners care about the common property as much as they do about their private property); **collective cooperation** = How would you rate your satisfaction with the cooperation with the co-owners? (from 1 – Very low to 5 – Very high); **building satisfaction** = How would you rate your general satisfaction with your building? (from 1 – Very low to 5 – Very high). \* $p < .001$ .

Source: author.

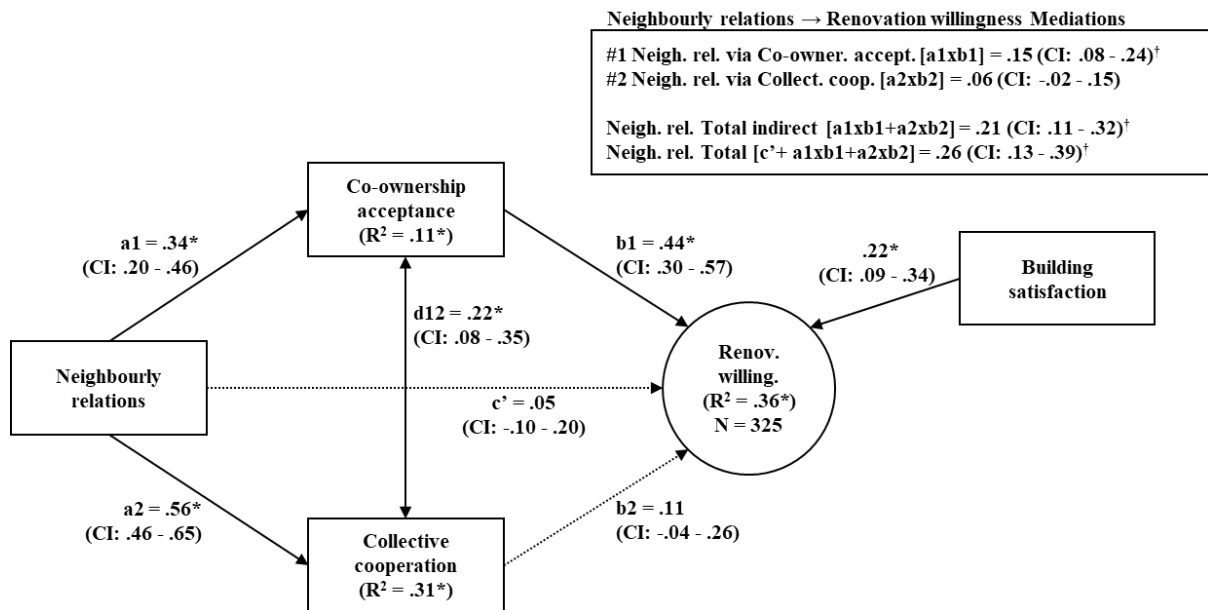
The model results (Figure 1) proved that the proposed m-RD model is successful in explaining a significant portion (36%;  $p < 0.001$ ) of the variance of renovation willingness. At the same time, neighbourly relations had a significant effect on the outcome, but in a complex way. The significant zero-order correlation ( $r(325) = 0.34, p < 0.001$ ; Table 1) implied that stronger neighbourly relations meant higher renovation willingness. However, the direct path coefficient between the two variables ceased to be significant ( $c' = 0.05, p > 0.05$ ) after co-ownership acceptance and collective cooperation were added to the analysis as parallel mediators (Figure 1). Instead, the effect of neighbourly relations on renovation willingness mediated through co-ownership acceptance was significant ( $a1b1 = 0.15, p < 0.001$ ): better neighbourly relations were related to higher co-ownership acceptance, which in turn was associated with increased renovation willingness. At the same time, although neighbourly relations positively affected collective cooperation ( $a2 = 0.56, p < 0.001$ ), the relation between collective cooperation and renovation willingness was non-significant ( $b2 = 0.11, p > 0.05$ ), rendering this entire indirect effect also non-significant ( $a2b2 = 0.06, p > 0.05$ ). Still, the two indirect effects add up to a significant total indirect effect of neighbourly relations on renovation willingness ( $a1b1 + a2b2 = 0.21, p < 0.001$ ).<sup>2</sup>

<sup>2</sup> Although the significant *co-ownership acceptance* – *collective cooperation* correlation ( $d12 = .22, p = .001$ ) suggested the specification of a serial mediator model with the specified direction flow between two mediators (Hayes 2022), tests of the two alternative models (with the opposite order of mediators) produced basically the same results as the current model. The same was the case for additional models with specific contextual factors referring to the respondents (sex, age, and the length of time they lived in the building as well as the length of their tenure as a representative) or to the buildings (size, period of construction, and location) included as





Figure 1: The mediated-Renovation Decision (m-RD) model estimates



Note: The predictors are denoted by the rectangular shape while the dependent variable is denoted by the circular shape. Lines with single-end arrows indicate the direction of influence. The numbers on the line are standardised path model coefficients and R<sup>2</sup> is full model coefficient of determination (\*p ≤ .01). The indirect influences of neighbourly relations on renovation willingness through co-ownership acceptance and collective cooperation are formally tested in a mediation model (upper right box; terms in the squared parenthesis specify how the particular coefficients were obtained; <sup>†</sup>95% bias-corrected bootstrap confidence intervals (CIs) do not encompass 0). Neigh. rel. = neighbourly relations; Co-owner. accept. = co-ownership acceptance; Collect. coop. = collective cooperation; Renov. willing. = renovation willingness.

Source: author.

## Discussion and conclusion

The proposed m-RD model of interplay of three specific determinants in explaining co-owners' willingness for building renovation proved to be indicative. The significant 36% of the outcome variance that is explained by just three predictors exceeds the results of similar studies that relied on a larger number of measures (e.g. Chavis and Wandersman 1990; Mandič and Filipovič Hrast 2019). Furthermore, the m-RD model shed more light on the possible mechanisms underlying the effects that these concepts have on residents' decisions and behaviour. For example, good interpersonal relations, by fostering communication and mutual trust among neighbours, mould a cooperative social milieu that may encourage collective decision-making and action. This effect is not necessarily direct, but, as demonstrated, could be indirect. Thus, within the m-RD model, one course of action is through strengthening the

moderators. Therefore, here we present the parallel mediator model as the most parsimonious one and the models with moderators are available in the Appendix.



co-owners' sense of shared interests in the common building property, which again makes them more willing to make actual renovation investments.

This interrelation between neighbourly relations and co-ownership acceptance implies their mutual importance in conditioning renovation willingness. Since good neighbourly relations are the foundation for co-ownership acceptance, the further strengthening of this factor seems important. For instance, a specific action to achieve this aim would include organising social activities in a multi-family building to encourage co-owners' sense of community, which could presumably strengthen their sense of responsibility for common building property and result in an increased readiness to initiate building renovation. The same is true for co-ownership acceptance, as this variable remained a significant predictor of renovation willingness even after its covariance with the remaining predictors in the m-RD model had been accounted for. Thus, direct interventions aimed at this factor, such as the education and persuasion of co-owners about the (financial) importance of the building's common property and its maintenance and management, could also create a more attainable context for building renovation. (For more details on these potential initiatives, see Yau 2010; Orbán 2006; Pojani and Baar 2016.)

According to the m-RD model, stronger neighbourly relations also imply better collective cooperation, but this effect failed to spill over into higher renovation willingness. However, it is possible that collective cooperation, as currently conceptualised, represents one of the aspects of co-ownership acceptance (e.g. acceptance of the common building property concept probably also implies cooperation with the building representative) and not a completely self-standing construct. If so, the conceptual overlap between these two factors could result in one of them being a non-significant predictor after the other one is accounted for. Nevertheless, the non-significant mediation effect leading from neighbourly relations via collective cooperation toward renovation willingness could probably reach significance once the measures in the m-RD model are better conceptualised. If that were the case, the role of the representative and the measures for reinforcing this role should not be overlooked either (Orbán 2006).

This under-operationalisation of concepts in the m-RD model could in future studies be addressed by employing (interval) multi-item scales for their measurement. The m-RD model should also be specifically tested in relation to objective outcomes (e.g. whether a renovation actually took place or not). Furthermore, future studies should also include, alongside representatives, the co-owners themselves. Besides improved generalisability, comparisons between representatives' and co-owners' reports could better explain the social dynamics behind residents' decisions and behaviours.

Combined with these methodological improvements, the further development of the m-RD model could also benefit from its more explicit immersion into broader sociological perspectives, such as the social-capital framework (e.g. Putnam 1993) or the concept of relational work in building management and maintenance (Cairns et al. 2023). For example, as a 'fuel' that should encourage joint activities, the concept of social capital refers to 'features of social organization, such as networks, norms, and trust, that facilitate coordination and cooperation for mutual benefit' (Putnam 1993: 36). It is therefore expected that a higher level of mutual trust, shared norms, and cooperation could also lead to more positive outcomes in the building renovation process. These three components could be partially recognised in dimensions of neighbourly relations, co-ownership acceptance, and collective cooperation already included in the m-RD. Furthermore, relying on ideas and concepts from relational



sociology, especially the concept of ‘relational work’, Cairns et al. (2023) concluded that more intimate relations between neighbours in multi-owned properties can be supportive of renovation work. According to the authors, this is especially important in a context where the legislation is inadequate and inhibits renovation because householders have to engage in too much relational work, meaning investing efforts into building and maintaining social relations (Cairns et al. 2023: 5).

Yet, such improvements in the m-RD model would not suffice to unravel a more fundamental question of the causal relations between constructs. Namely, the proposed m-RD model is only one of the possible theoretical patterns of (causal) interrelations among included measures. For example, it is perfectly possible to conceptualise the mutual influences among variables (Bengtsson 1998) or even, in the scenario most opposite to the current one, to assume the causal relations of reversed directions. Nevertheless, in line with the rationale presented in the introduction, we believe that it is more plausible that causality flows from neighbourly relations, as a contextual variable reflecting the (micro-)community, toward narrower, more person-related measures of co-ownership acceptance, collective cooperation, and renovation willingness than vice versa. Still, as already noted, current theoretical accounts of the possible interactions among these concepts are insufficient or even somewhat conflicting (compare, e.g., Bengtsson 1998; Chavis and Wandersman 1990). In addition to the more solid theoretical foundations, resolving this (cause-effect) dilemma requires the employment of complementary research methods: (quasi-)experimental, longitudinal, observational, etc.

However, despite these theoretical and methodological shortcomings, we consider the m-RD model to be a step forward. As noted above, the m-RD model in its current (rudimentary and exploratory) form is only an initial analytical framework, but it is a framework that has already succeeded in proving the importance of social relations in multi-family building management and how these relations contribute to residents’ renovation decisions. The study demonstrated the catalytic effect neighbouring relations could have on residents’ attitudes, behaviours, and intentions concerning their building’s common property. These results support a model in which neighbourly relations, by encouraging the acceptance of the common property concept (and collective cooperation) among co-owners, positively affects their willingness to improve their building. In this sense, good neighbourly relations are a framework that, in the absence of a proper legislative guideline, can facilitate other determinants of community actions. Thus, the demonstrated analytical value of the m-RD model advocates for a further, more detailed dissection of the mechanisms that steer the determinants of collective decision-making and actions in the context of housing.

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## References

- Bengtsson, B. 1998. 'Tenants' Dilemma – On Collective Action in Housing.' *Housing Studies* 13 (1): 99-120. <https://doi.org/10.1080/02673039883515>
- Borisova, E. I., L. Polishchuk, A. Peresetsky 2014. 'Collective Management of Residential Housing in Russia: The Importance of Being Social.' *Journal of Comparative Economics* 42 (3): 609-629. <https://doi.org/10.1016/j.jce.2014.04.007>
- Cairns, I., M. Hannon, M. Davis, L. Middlemiss, A. Owen, R. Bookbinder, G. Mininni, D. Brown, M. C. Brisbois 2023. 'Under One Roof : The Social Relations and Relational Work of Energy Retrofit in Multi-owned Properties.' *Preprint / Working Paper*. Glasgow: University of Strathclyde. <https://doi.org/10.17868/strath.00084471>
- Chavis, D. M., A. Wandersman 1990. 'Sense of Community in the Urban Environment: A Catalyst for Participation and Community Development.' *American Journal of Community Psychology* 18 (1): 55-81. <https://doi.org/10.1007/BF00922689>
- Cirman, A., S. Mandič, J. Zorić 2013. 'Decisions to Renovate: Identifying Key Determinants in Central and Eastern European Post-socialist Countries.' *Urban Studies* 50 (16): 3378-3393. <https://doi.org/10.1177/0042098013482509>
- Hayes, A. F. 2022. *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-based Approach*. New York: The Guilford Press.
- Kearns, A., R. Forrest 2000. 'Social cohesion and multilevel urban governance.' *Urban studies* 37 (5-6): 995-1017. <https://doi.org/10.1080/00420980050011208>
- Leung, C. C. 2005. *Resident Participation: A Community-building Strategy in Low-income Neighbourhoods*. Cambridge: Joint Center for Housing Studies of Harvard University.
- Mandič, S., M. Filipovič Hrast 2019. 'Homeownership in Multi-apartment Buildings: Control Beyond Property Rights.' *Housing, Theory and Society* 36 (4): 401-425. <https://doi.org/10.1080/14036096.2018.1510853>
- Middleton, A., A. Murie, R. Groves 2005. 'Social Capital and Neighbourhoods That Work.' *Urban Studies* 42 (10): 1711-1738. <https://doi.org/10.1080/00420980500231589>
- Muthén, L. K., B. O. Muthén 1998-2017. *Mplus User's Guide*. Eighth Edition. Los Angeles: Muthén & Muthén.
- Orbán, A. 2006. *Community Action for Collective Goods: An Interdisciplinary Approach to the Internal and External Solutions to Collective Action Problems: The Case of Hungarian Condominiums*. Budapest: Akadémiai Kiadó.
- Pojani, D., K. Baar 2016. 'Multi-family Housing Management in Post-socialist Countries: The Albanian Experience.' *Journal of Housing and the Built Environment* 31 (4): 743-760. <https://doi.org/10.1007/s10901-016-9498-1>



Putnam, R. 1993. 'The Prosperous Community: Social Capital and Public Life.' *The American Prospect* 13 (4): 35-42.

Stephens, M., M. Lux, P. Sunega 2015. 'Post-socialist Housing Systems in Europe: Housing Welfare Regimes by Default?' *Housing studies* 30 (8): 1210-1234. <https://doi.org/10.1080/02673037.2015.1013090>

Svirčić Gotovac, A., S. Podgorelec, Ž. K. D. Villa 2021 'The quality of life in housing estates in the context of West-european and post-socialist countries.' *Geoadria* 26 (2): 143-166. <https://doi.org/10.15291/geoadria.3414>

Temkin, K., W. M. Rohe 1998. 'Social Capital and Neighborhood Stability: An Empirical Investigation.' *Housing Policy Debate* 9 (1): 61-88. <https://doi.org/10.1080/10511482.1998.9521286>

Yau, Y. 2010. 'Sense of Community and Homeowner Participation in Housing Management: A Study of Hong Kong.' *Urbani izziv* 21 (1): 126-135. <https://www.jstor.org/stable/24920518>

Yau, Y. 2011a. 'Collectivism and Activism in Housing Management in Hong Kong.' *Habitat International* 35 (2): 327-334. <https://doi.org/10.1016/j.habitatint.2010.11.006>

Yau, Y. 2011b. 'Homeowners' Participation in Management of Multi-storey Residential Buildings.' *Property Management* 29 (4): 345-356. <https://doi.org/10.1108/02637471111154791>

Wekerle, G. R., R. Dragicevic, R. Jordan, I. Kszyk, M. Sorenson 1980. 'Contradictions in Ownership, Participation and Control: The Case of Condominium Housing.' Pp. 170-191 in C. Ungerson, V. Karn (eds.) *The Consumer Experience of Housing: Cross-national Perspectives*. Farnborough: Gower.



## Appendix

### Mediated-Renovation Decision (m-RD) model: moderated mediations

In order to control for possible confounding effects of specific contextual variables, mediations embedded within the mediated-Renovation Decision (m-RD) model were also tested under moderation of factors referring to the respondents (sex, age and the length of their residence in the building as well as of their representative tenure) or to the buildings (size, period of construction, and location) included as moderators. Thus, all resulting models are based on the initial m-RD model (see Figure 1 in the main text) tested in parallel at each level of the given moderator. Table A1 presents the estimates for seven resulting moderated m-RD models. All relevant explanations are provided in the Table A1 footnotes.

### Summary of moderated mediation tests

As presented in Table A1, all tested models explained a significant portion of the variance of renovation willingness (at  $\alpha$  level of 0.05 or less). The direct relation between neighbourly relations and renovation willingness was non-significant in all models (all  $ps > 0.05$ ). The effect of neighbourly relations on renovation willingness mediated through co-ownership acceptance was significant in all models (at  $\alpha$  level of 0.05 or less). The effect of neighbourly relations on renovation willingness mediated through collective cooperation was significant ( $p < 0.05$ ) only at the first level (“<17 years”) of the Length of residence in the building moderator.

**Table A1. The mediated-Renovation Decision (m-RD) model estimates by moderator level**

Moderator	Moderator level	Variable	M	SD	Model results					Neighbourly relations → Renovation				R <sup>2</sup>							
					1.		2.		3.	willingness Mediations <sup>g</sup>		Neighbourly relations Effects <sup>g</sup>									
					$\beta^d$	95% CI	$\beta^e$	95% CI	$\beta^f$	95% CI	via Co-owner. accept.	via Collect. coop.	Total indirect		Total	95% CI	95% CI				
Respondent sex (N = 325)	Male (N = 156)	1. renovation willingness	2.19	.61								.17**	.06 - .32	.07	-.06 - .19	.24**	.07 - .42	.31**	.10 - .50	.46***	
		2. neighbourly relations	3.29	.71	.07	-.19 - .34															
		3. co-ownership acceptance	2.01	.48	.49***	.29 - .67	.35***	.14 - .53													.12
		4. collective cooperation	3.21	.73	.12	-.10 - .31	.58***	.44 - .70	.00	-.18 - .25											.34***
		5. building satisfaction	3.44	.81	.27**	.07 - 0.50	-	-	-	-											
	Female (N = 169)	1. renovation willingness	2.11	.66								.15*	.06 - .29	.07	-.05 - .19	.22**	.09 - .36	.23**	.05 - .40	.29***	
		2. neighbourly relations	3.32	.68	.01	-.17 - .19															
		3. co-ownership acceptance	1.89	.55	.42***	.21 - .70	.35***	.16 - .52													.12
		4. collective cooperation	3.20	.86	.13	-.09 - .34	.54***	.39 - .66	.35***	.18 - .51											.29***
		5. building satisfaction	3.06	.75	.15	-.03 - .32	-	-	-	-											
Respondent age <sup>a</sup> (N = 325)	< 50 years old (N = 170)	1. renovation willingness	2.15	.66								.21**	.10 - .37	.09	-.03 - .20	.30**	.14 - .48	.29**	.12 - .46	.50***	
		2. neighbourly relations	3.34	.75	-.01	-.24 - .20															
		3. co-ownership acceptance	1.90	.51	.50***	.29 - .68	.42***	.23 - .57													.18*
		4. collective cooperation	3.22	.82	.14	-.04 - .32	.61***	.48 - .72	.14	-.05 - .36											.38***
		5. building satisfaction	3.22	.87	.31***	.15 - .48	-	-	-	-											
	≥ 50 years old (N = 155)	1. renovation willingness	2.15	.61								0.11*	.02 - .25	.04	-.08 - .17	.15*	.02 - .29	.20*	-.01 - .40	.23*	
		2. neighbourly relations	3.27	.64	.06	-.16 - .28															
		3. co-ownership acceptance	2.00	.52	.40***	.18 - .63	.27**	.06 - .45													.07
		4. collective cooperation	3.19	.78	.08	-.16 - .32	.48***	.31 - .62	.28**	.07 - .47											.23**
		5. building satisfaction	3.26	.73	.09	-.10 - .27	-	-	-	-											
Length of residence in the building <sup>a</sup> (N = 305)	< 17 years (N = 154)	1. renovation willingness	2.21	.63								.14*	.05 - .30	.14*	.03 - .29	.28***	.14 - .45	.33**	.12 - .53	.38***	
		2. neighbourly relations	3.32	.74	.05	-.18 - .27															
		3. co-ownership acceptance	1.94	.49	.34**	.12 - .55	.43***	.22 - .59													.18*
		4. collective cooperation	3.23	.78	.23*	.03 - .44	.58***	.44 - .70	.19	-.03 - .37											.34***
		5. building satisfaction	3.21	.87	.23*	.03 - .40	-	-	-	-											
	≥ 17 years old (N = 151)	1. renovation willingness	2.09	.65								.11*	.02 - .25	.01	-.11 - .12	.12	-.01 - .26	.16	-0.38	.31**	
		2. neighbourly relations	3.29	.67	.04	-.17 - .25															
		3. co-ownership acceptance	1.96	.54	.46***	.25 - .66	.24*	.03 - .43													.06
		4. collective cooperation	3.19	.84	.02	-0.20 - .24	.51***	.34 - .64	.26**	.07 - .44											.26**
		5. building satisfaction	3.29	.73	.24**	.06 - .42	-	-	-	-											

Table A1. Continuation

Moderator	Moderator level	Variable	M	SD	Model results						Neighbourly relations → Renovation					R <sup>2</sup>					
					1.		2.		3.		willingness Mediations <sup>g</sup>		Neighbourly relations Effects <sup>g</sup>								
					$\beta^d$	95% CI	$\beta^e$	95% CI	$\beta^f$	95% CI	via Co-owner. accept.	95% CI	via Collect. coop.	95% CI	Total indirect		95% CI	Total	95% CI		
Length of representative tenure <sup>a</sup> (N = 324)	< 4 years (N = 160)	1. <i>renovation willingness</i>	2.12	.63								.16**	.07 - .29	.13	-.02 - .29	.29**	.11 - .47	.28**	.09 - .46	.35***	
		2. <i>neighbourly relations</i>	3.28	.79	.00	-.25 - .23															
		3. <i>co-ownership acceptance</i>	1.94	.50	.39***	.20 - .58	.40***	.21 - .56													.16*
		4. <i>collective cooperation</i>	3.18	.82	.20	-.03 - .42	.66***	.53 - .76	.13	-.07 - .31											.43***
		5. <i>building satisfaction</i>	3.19	.86	.24*	.05 - .42	-	-	-	-											
	≥ 4 years (N = 164)	1. <i>renovation willingness</i>	2.18	.65								.14*	.03 - .29	.03	-.07 - .12	.17*	.04 - .30	.25*	.05 - .43	.38***	
		2. <i>neighbourly relations</i>	3.33	.60	.08	-.039															
		3. <i>co-ownership acceptance</i>	1.96	.54	.50***	.28 - .70	.28**	.06 - .47													.08
		4. <i>collective cooperation</i>	3.22	.77	.06	-.16 - .26	.44***	.28 - .58	.29**	.08 - .46											.20**
		5. <i>building satisfaction</i>	3.29	.74	.20*	.01 - .37	-	-	-	-											
Building size <sup>a</sup> (N = 232)	≤ 20 co-owners (N = 169)	1. <i>renovation willingness</i>	2.20	.61								.17*	.06 - .32	.01	-.12 - .13	.18*	.05 - .33	.19*	.01 - .38	.30**	
		2. <i>neighbourly relations</i>	3.35	.74	.02	-.19 - .22															
		3. <i>co-ownership acceptance</i>	1.98	.55	.43***	.21 - .64	.39***	.20 - .55													.15*
		4. <i>collective cooperation</i>	3.28	.80	.02	-.20 - .22	.59***	.44 - .71	.26**	.06 - .42											.35***
		5. <i>building satisfaction</i>	3.16	.85	.25**	.06 - .42	-	-	-	-											
	> 20 co-owners (N = 154)	1. <i>renovation willingness</i>	2.10	.66								.12*	.03 - .25	.09	.00 - .22	.22**	.07 - .39	.32**	.14 - .50	.47***	
		2. <i>neighbourly relations</i>	3.26	.64	.11	-.12 - .33															
		3. <i>co-ownership acceptance</i>	1.92	.47	.48***	.30 - .66	.26*	.04 - .44													.07
		4. <i>collective cooperation</i>	3.12	.79	.18	-.02 - .38	.51***	.35 - .64	.16	-.06 - .36											.26**
		5. <i>building satisfaction</i>	3.33	.74	.25**	.07 - .41	-	-	-	-											
Period of building construction <sup>b</sup> (N = 325)	Socialist (1945-1990) (N = 181)	1. <i>renovation willingness</i>	2.14	.61								.15*	.05 - .30	-.05	-.17 - .06	.11	-.04 - .26	.25**	.08 - .41	.40***	
		2. <i>neighbourly relations</i>	3.30	.64	.14	-.07 - .34															
		3. <i>co-ownership acceptance</i>	1.97	.50	.50***	.33 - .66	.30**	.10 - .48													.09
		4. <i>collective cooperation</i>	3.19	.76	-.09	-.30 - .12	.52***	.39 - .63	.23*	.04 - .41											.28***
		5. <i>building satisfaction</i>	3.17	.73	.28***	.13 - .43	-	-	-	-											



Table A1. Continuation

Moderator	Moderator level	Variable	M	SD	Model results						Neighbourly relations → Renovation					R <sup>2</sup>					
					1.		2.		3.		willingness		Mediations <sup>g</sup>		Neighbourly relations Effects <sup>g</sup>						
					$\beta^d$	95% CI	$\beta^e$	95% CI	$\beta^f$	95% CI	via Co-owner. accept.	95% CI	via Collect. coop.	95% CI	Total indirect		95% CI	Total	95% CI		
Building location <sup>c</sup> (N = 325)	Zagreb (N = 205)	1. renovation willingness	2.15	.63								.19**	.09 - .32	.07	-.03 - .19	.26***	.12 - .42	.34***	.17 - .51	.43***	
		2. neighbourly relations	3.32	.70	.08	-.14 - .29															
		3. co-ownership acceptance	1.94	.49	.50***	.30 - .66	.37***	.19 - .53													.14*
		4. collective cooperation	3.15	.82	.12	-.06 - .30	.59***	.47 - .69	.18*	.00 - .34											.35***
		5. building satisfaction	3.26	.80	.15	-.02 - .32	-	-	-	-											
	Other (N = 120)	1. renovation willingness	2.14	.65								.12*	.03 - .28	.05	-.09 - .19	.17*	.03 - .33	.16	-.06 - .36	.28**	
		2. neighbourly relations	3.28	.69	-.01	-.24 - .21															.11
		3. co-ownership acceptance	1.96	.56	.36**	.11 - .59	.33**	.09 - .53													.27**
		4. collective cooperation	3.29	.76	.07	-.16 - .35	.52***	.31 - .67	.29*	.03 - .51											
		5. building satisfaction	3.21	.81	.31**	.12 - .48	-	-	-	-											

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

<sup>a</sup>Moderator levels were defined by its median value in order to obtain subsamples of sufficient size to test the m-RD model.

<sup>b</sup>Period of building construction was preconceived as a moderator with three levels (before 1945, socialist, and post-socialist construction period) but only the subsample for socialist period was of sufficient size for testing the m-RD model.

<sup>c</sup>Defining the levels of building location moderator as Zagreb vs. Other locations was motivated by intention to test the m-RD model in a Zagreb subsample, as a more homogeneous one, and in the Other location subsample, as a more heterogeneous one.

<sup>d</sup>Standardised path model coefficients leading from corresponding variable toward renovation willingness (see Figure 1 in the main text).

<sup>e</sup>Standardized path model coefficients leading from neighbourly relations toward corresponding variable (see Figure 1 in the main text).

<sup>f</sup>Standardized path model coefficient for correlation between co-ownership acceptance and collective cooperation.

<sup>g</sup>For the procedure of obtaining the particular coefficient see Figure 1 in the main text.