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Direct and Indirect Impacts of Housing Tenure Mix on Antisocial Behavior: A Study of Hong Kong's Private Housing Communities

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Abstract: The problem of antisocial behavior (ASB) undermines the life quality of urban residents. While many previous studies on ASB focused on the solutions, little effort has been dedicated to finding out the social determinants of the levels of ASB problems in private housing communities, especially in high-rise residential settings in Asian cities. Previous empirical research suggests that ASB seriousness can be a function of poor neighborliness, community detachment and management efficacy. Yet, the link between housing tenure mix and ASB problems has been underexplored in the literature. In this light, a multilevel design with hierarchical modeling was employed to test the hypothesized direct and indirect (moderation) effects of housing tenure mix on the perceived seriousness of ASB in neighborhoods. The dataset came from a structured questionnaire survey of 592 residents living in 17 private high-rise housing communities in Tseung Kwan O, Hong Kong. The results indicated that the seriousness of the ASB problem was largely dependent on poor neighborliness and community detachment. A higher level of renting in a housing community was also found to amplify perceived ASB seriousness, and enhance the influence of poor neighborliness on ASB seriousness. The research findings highlight the importance of tenure mix in predicting the degree of ASB proliferation in a housing community.

Keywords: antisocial behavior; gated communities; housing tenure; high-rise living; community attachment; neighborliness; Hong Kong

1. Introduction

It is the aspiration of many people to have a comfortable home. However, livability depends on a wide variety of factors, ranging from housing design to community management. Residents' behavior is also a critical determinant of the peacefulness of a housing community. In many different countries, residents suffer from varying levels of antisocial behavior (ASB) or disruptive neighbor behavior. For instance, 25% of public housing tenants in Hong Kong found the problem of disruptive neighbors in their housing communities to be intolerable (Yau 2012b). In Singapore, noise has been the most-disliked aspect of the Housing and Development Board estates in the eyes of the residents (Housing and Development Board 2014). Furthermore, many residents complained of inconsiderate neighbors for littering or disposing of bulky items in the estates' communal areas. In the national survey conducted in Australia, 69% of adults reported at least one neighborhood problem (like ASB) in their neighborhoods (Australian Statistics Bureau 2010). In England and Wales, about 40% of the adults experienced or witnessed ASB in their neighborhoods (Office for National Statistics 2019). According to the results of a Belgium-based survey, 46% of the respondents reported nuisance behavior from their neighbors (Michaux et al. 2017).

Consequences of ASB proliferation in housing communities include social disruption, reduced residential satisfaction, poor physical and mental health and intensified fear of crime

(Agyemang et al. 2007; Browne-Yung et al. 2016; Curtis et al. 2004; Jacobson et al. 2008; Oh et al. 2019). As posited by the broken window theory, ASB can breed more serious crimes (Skogan 1990; Kelling and Wilson 1982). A high level of ASB prevalence also suppresses property prices in a neighborhood (Seo 2018). In view of ASB proliferation and its costly outcomes, governments have introduced different measures to curb the problem. These measures include probationary tenancies, evictions, good neighbor agreements and ASB orders (Croucher et al. 2007; Vols 2014; Yau and Chiu 2017a). However, it seems that these initiatives are not effective in containing the ASB problem in housing communities. For better-informed policy-making to deal with the ASB problem, it is necessary to identify the factors contributing to ASB proliferation. There is also a missing part in the existing literature. While the majority of housing-related ASB studies focus on the relatively low-rise residential setting in the west, the ASB problem in high-rise housing communities in Asian cities has been largely ignored. Moreover, too much academic attention has been placed on social or public housing. The extant literature does not provide any empirical inquiry into whether private housing estates with larger proportions of renters are more problematic in terms of ASB proliferation or not. To fill these research gaps, this study aims to explore the relationship between the levels of renting and the extents of ASB problems in private high-rise residential neighborhoods in Hong Kong. In this light, the role played by housing tenure mix in determining ASB levels is scrutinized in the current empirical study.

2. Literature Review and Hypotheses

2.1. ASB Proliferation: What and Why?

The concept of ASB is very elastic (Brown 2004; Shani 2017; Young 2016). Without a universally accepted definition, the term “ASB” refers to different things in varying contexts (Millie 2009). In terms of housing governance, the Chartered Institute of Housing (1995) defined ASB as wrong-doing undertaken against the society’s acceptable behavioral standards or norms. On the other hand, Millie and Jacobson (2005, p. 3) defined ASB in a very detailed manner, as behavior that “causes harassment, alarm or distress to individuals not of the same household as the perpetrator, such that it requires interventions from the relevant authorities; but criminal prosecution and punishment may be inappropriate because individual components of the behavior are not prohibited by criminal law or in isolation constitute relative minor offences”. The term “ASB” is commonly used in Australia and the United Kingdom (UK) (Yau 2012a). In other jurisdictions, ASB may be defined as “incivilities”, “neighbor nuisances”, “petty offences” or “quality-of-life crimes” (Yau 2012a; Peršak and Ronco 2018).

ASB can take different forms, ranging from deliberate littering, noise nuisances, graffiti and abusive uses of communal space, to racial harassment and intimidation. On account of the floating definition of ASB, behavior that is considered unacceptable or “antisocial” to one person can be regarded as acceptable to another (Home Office 2003). One’s perception of ASB is shaped by a vector of factors, including social norm, interpretation, context and location (Mackenzie et al. 2010; Nixon et al. 2003). Hence, ASB prevailing in the west may be different from that in the east. Besides, certain types of ASB are more usual in low-rise residential neighborhoods, while some others are more common in their high-rise counterparts (Kearns et al. 2012; Yau 2014). For example, the ignoring of leaking pipework that results in water seepages and the throwing of objects from a height are more prevalent in high-rise apartments in Asian cities.

Different schools of thought attempt to explain ASB proliferation. From the structuralist’s perspective, ASB proliferates in a society as a result of a decline in moral standards and family values (Millie and Jacobson 2005). The findings of Ipsos MORI (2006) and Jacobs and Arthurson (2003) affirmed that insufficient available opportunities for young people, and poor parenting, were key contributors to ASB proliferation in the UK. On the other hand, individualists ascribed the ASB problem to personal experience and factors like childhood abuse and neglect, poor educational attainment, unemployment and substance abuse (Eysenck 1996; Home Office 2003; Kerig and Becker 2015; Morizot 2014). On top

of these structural and individualistic viewpoints, [Jacobs and Arthurson \(2003\)](#) argued that poor housing design and planning could be an influential promoter of neighborhood problems. [Yau and Chiu \(2017b\)](#) and [Yau \(2018a\)](#) showed that the design of housing blocks shaped residents' perceptions of ASB severity.

2.2. Housing Tenure and ASB Proliferation

Many previous works contended that the problem of ASB was more prevalent in social housing, so the social landlords should take bold and determined steps to tackle the problem ([Brown 1999](#); [Brown 2004](#); [Burney 1999](#)). Perhaps, this line of thought was founded upon our common understanding of the locations of neighborhood problems ([Atkinson 2006](#); [Lee and Murie 1997](#)). Alternatively, the bias against social housing is probably because it is easier to implement ASB controls (e.g., probationary tenancies, marking schemes and mandatory evictions) in the social housing sector, from the perspective of welfare conditionality ([Deacon 2004](#); [Watts and Fitzpatrick 2014](#); [Yau 2013](#)). While it is quite obvious that many ASB control measures are tenure-biased, ASB proliferation itself could be tenure-neutral ([Flint and Nixon 2006](#); [Scott and Parkey 1998](#); [Yau 2012a](#)). It is correct for [Carr and Cowan \(2006\)](#) and [Yau \(2012a\)](#) to argue that regarding social housing as dangerous and productive of ASB is de facto a self-fulfilling prophecy or a misplaced assumption. As a matter of fact, a number of studies ([Cheshire and Fitzgerald 2015](#); [Harris 2016](#); [Yau 2012a](#)) suggested that the problems of disruptive neighbors or ASB in private housing were not ignorable.

Putting aside the debate about the location-dependence of ASB, it is still important to advance our understanding of how housing tenure shapes ASB proliferation. Many theoretical or empirical studies (e.g., [Atkinson 2005](#); [Hegerty 2017](#); [Livingston et al. 2014](#)) associated housing tenure with crime or fear of crime. Renters are generally perceived as disinvested or dangerous to neighborhood safety ([Rollwagen 2015](#)). On the other hand, housing tenure mix has received far less attention in ASB research. [Baum et al. \(2015\)](#) investigate the association between housing tenure mix and ASB levels in Australia. According to the results of their research, neighborhoods with high shares of owner-purchasers seemed to be associated with less severe ASB problems, while the problem grew when the level of renting was higher. Similarly, studying Finnish housing estates, [Kemppainen et al. \(2017\)](#) found a strong positive correlation between the perceived level of social disorder and the proportion of rental apartments in an estate.

2.3. Neighborliness, Community Attachment and ASB Proliferation

There is an established link between the social quality of a housing community and ASB seriousness in the literature. From the perspective of collective efficacy, housing communities with stronger solidarity among residents or higher levels of neighborliness are more capable of organizing around neighborhood problems and alleviating neighborhood disorder ([Batson and Monnat 2015](#); [Hirvonen and Lilius 2019](#); [Kubrin and Weitzer 2003](#); [Morenoff et al. 2001](#); [Yamamoto 2018](#)). [Ross et al. \(2001\)](#) divulged a strong positive correlation between the level of trust among residents and the degree of disorder in a residential neighborhood. In a recent study by [Michaux et al. \(2017\)](#), the perceived neighbor relationship was found to be highly related to the occurrence of neighborhood problems in Belgium. Even though there is a high degree of resident heterogeneity within a housing community, the neighborhood quality can be maintained when strong social networks or supports are present ([Takagi and Kawachi 2014](#)). Conversely, a higher level of neighborhood disorder can be a result of weak social ties within a housing community ([Dassopoulos et al. 2012](#)). Residents tend to be uninterested in the conditions of their communities, and invest less in their communities when their attachment to the community is weak. This view is supported by the empirical evidence of [Brown et al. \(2003\)](#) and [Brown et al. \(2004\)](#), who illustrated that fewer neighborhood incivilities or instances of social disorder were perceived by residents who were more attached to their housing communities.

2.4. Housing Management and ASB Proliferation

Proper and effective housing management is conducive to easing the problem of ASB in a housing community (Brown 2004; Burney 2000; Jacobs and Arthurson 2003). Apart from the residents’ own efforts of controlling ASB, property management agents (PMAs) also play an important role in dealing with ASB and preserving peacefulness in a private housing community (Yau 2018b). On one hand, PMAs enforce the deeds of mutual covenants and house rules, to make sure that residents’ behavior is not disruptive. Upon the receipt of complaints, PMAs need to investigate the case. On the other hand, PMAs need to resolve disputes among residents. That demands different skills from the PMAs, like mediation skills (Habibis 2007; Jacobs and Arthurson 2004). It has been found that the more efficacious a PMA is, the lower the level of ASB proliferation in a housing community will be (Yau 2018b).

2.5. Conceptual Framework and Hypotheses

Although a lot of works have been dedicated to exploring the effects of housing tenure mix on neighborhood crime or fear of crime, there is still a dearth of literature on the linkage between housing tenure mix and ASB proliferation. More importantly, the extant literature investigating that link is mostly based on relatively low-rise residential settings in Europe or Australia. The explanation of ASB proliferation in high-rise housing communities in Asian cities has not been accorded equal scholarly attention. In response to these research gaps, this study aims to explore the direct and indirect impacts of housing tenure mix on the levels of the ASB problem in private high-rise housing communities in Hong Kong. It is expected that the research can facilitate a better understanding of how housing tenure mix affects the extents of the ASB problem in housing communities. The conceptual framework of the study is shown in Figure 1. As suggested in the literature, poor neighborliness and community detachment are closely related to the extent of the ASB problem or neighborhood disorder. It is envisaged that the weaker the neighborliness and community attachment in a housing community is, the more serious the problem of ASB proliferation will be in the community, because informal ASB control is unorganized or ineffective. In order words, poor neighborliness and community detachment are likely to act as promoters of the ASB problem in a residential neighborhood. Besides, the efficacy of PMA in ASB control is incorporated into the conceptual framework as well. A negative relationship between management efficacy and the level of ASB seriousness is expected.

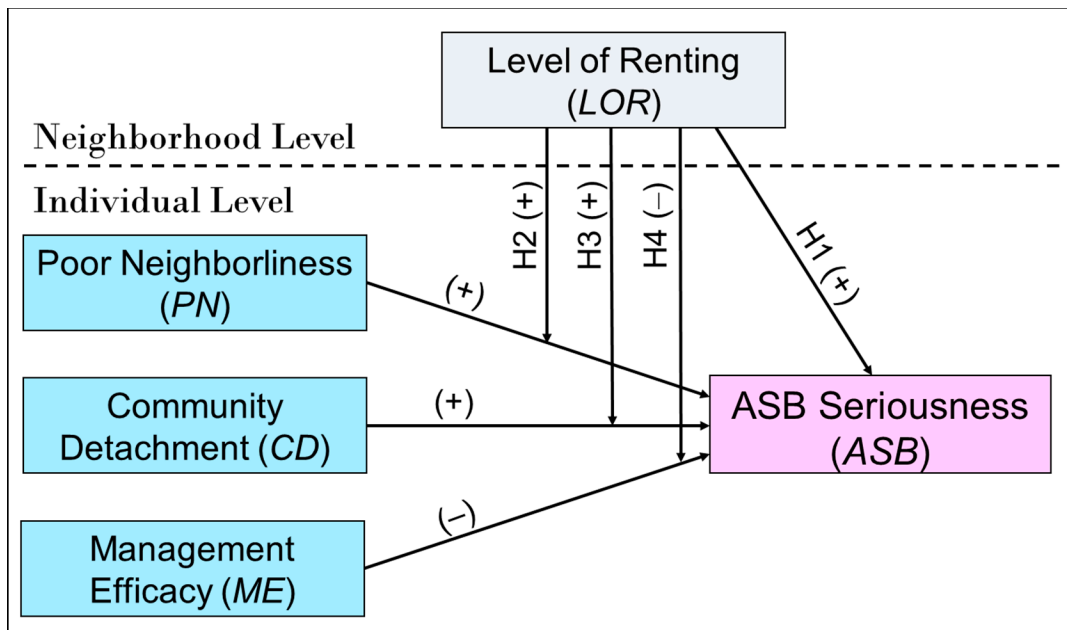


Figure 1. Conceptual framework of the research.

Poor neighborliness, community detachment and management efficacy are control variables in the empirical study. To reiterate, the focus of the current research is put on how housing tenure mix shapes ASB proliferation. In this research, housing tenure mix is represented by the level of renting. It is expected that the problem of ASB is more serious in housing communities with higher levels of renting. In addition to the direct effect, the level of renting may alter the influence of poor neighborliness, community detachment and management efficacy on ASB seriousness. Higher levels of renting are envisaged to strengthen the *PN-ASB* and *CD-ASB* paths. This is because, compared with owner-occupiers, renters are “less likely to have a stake in the community where they live and are subsequently disinclined to participate in neighborhood organizations” (Jennings and Fox 2015, pp. 314–15). Neighbor relationships between owner-occupiers and renters are generally poorer, increasing the likelihood of conflict between these parties within housing communities (Beekman et al. 2001). A greater number of renters may also mean a higher degree of population turnover in a housing community, which is not beneficial to community attachment and cohesion (Bailey et al. 2012). Therefore, tenure diversity is expected to amplify the impacts of poor neighborliness and community detachment on ASB proliferation. As a whole, the level of renting tends to enhance the effects of the risk factors of ASB proliferation. At the same time, housing management is more challenging in mixed communities (Tunstall and Fenton 2006). In the presence of a higher proportion of unstable or mobile residents in a housing community, it is difficult for the PMA to control ASB within the community. As a result, the desirable influence of a PMA’s higher management efficacy on the repression of ASB proliferation can be weakened due to greater tenure diversity. Based on the conceptual framework of the study, the following hypotheses were proposed:

Hypothesis 1 (H1). *Level of renting positively influences ASB seriousness;*

Hypothesis 2 (H2). *The positive relationship between poor neighborliness and ASB seriousness will be strengthened with a higher level of renting;*

Hypothesis 3 (H3). *The positive relationship between community detachment and ASB seriousness will be strengthened with a higher level of renting;*

Hypothesis 4 (H4). *The negative relationship between management efficacy and ASB seriousness will be weakened with a higher level of renting.*

3. Research Design

The hypotheses proposed in Section 2.5 were tested with data collected from a structured questionnaire survey performed in selected private high-rise housing estates in Hong Kong. Hong Kong offers a good laboratory for the empirical study because, unlike its western counterparts, its private housing communities are predominately high-rise. Besides, private housing communities in the city are highly gated (La Grange 2014; La Grange 2018; Wang and Lau 2013). On account of the high level of gatedness, the ASB under investigation can be largely limited to that caused or initiated by the residents. In this section, how the constructs were operationalized and how the data were collected are detailed.

3.1. Operationalization of Constructs

For empirical testing of the research hypotheses, the constructs in Figure 1 had to be operationalized. *ASB*, which denotes a resident’s perceived seriousness of the ASB in his or her housing community, was measured with the scale developed by Yau and Chiu (2017a). In the scale, the six types of ASB commonly found in Hong Kong’s housing communities were covered. They were (a) noise nuisances, (b) littering, (c) uncontrolled animals, (d) graffiti, fly-posting and vandalism, (e) abusiveness of common areas, and (f) intimidation and harassment. A resident was asked to rate the level of seriousness of

these six types of ASB in his or her housing communities using a four-point scale (4 = very serious; 3 = serious; 2 = still tolerable; 1 = not an issue at all). The overall level of ASB seriousness perceived by the resident was calculated as the arithmetic mean of the scores for the six aspects. A higher overall score meant a higher degree of ASB seriousness perceived by the resident.

Poor neighborliness, *PN*, concerns how poor is the neighborliness perceived by a resident. It was measured using a five-item scale adapted from the neighborliness scales employed by previous empirical studies, such as [Batson and Monnat \(2015\)](#), [Dassopoulos et al. \(2012\)](#) and [Larsen et al. \(2004\)](#). The resident was asked to indicate his or her agreement with five statements—"I live in a close-knit community", "I can trust my neighbors", "My neighbors get along well", "My neighbors' interests and concerns are important to me", and "If there were a serious problem in my community, the residents would get together to solve it", using a four-point Likert scale (with 4 = strongly disagree and 1 = strongly agree). A higher arithmetic mean of the scores for the five items indicated poorer neighborliness perceived by the resident.

As for community detachment, *CD*, it was operationalized with reference to [Bonaiuto et al. \(1999\)](#) and [Comstock et al. \(2010\)](#). A four-item scale was developed for the measurement of *CD*. These items were "This is the ideal housing community to live in", "Now this housing community is a part of me", "There are places or people in the housing community to which I am very emotionally attached", and "I would not willingly leave this housing community for another". A resident was asked to indicate his or her agreement with these statements using a four-point Likert scale (with 4 = strongly disagree and 1 = strongly agree). A greater degree of community detachment was reflected by a higher arithmetic mean of the scores for the four items.

Management efficacy, *ME*, quantifies how a resident perceives the efficacy of his or her PMA in controlling ASB in his or her housing community. Making reference to [Yau \(2018b\)](#), I measured *ME* with a three-item scale. The resident was asked to indicate his or her agreement with three statements—"My property management agent is competent in controlling ASB in my housing community", "My property management agent is knowledgeable in building management", and "My property management agent is willing to get involved in neighbor disputes in my housing community", using a four-point Likert scale (with 4 = strongly agree and 1 = strongly disagree). An overall index of perceived management efficacy was calculated by taking a simple arithmetic mean of the three scores. A higher average score signified a greater level of efficacy of the PMA in controlling ASB.

Level of renting, *LOR*, is a neighborhood-level measure. It was indicated as the percentage of households in a housing community that were renters. Data for this construct came from the 2016 Population By-census. Census data, including housing characteristics of the households aggregated at the street-block level, were publicly available on various online platforms, like CentaMap. In addition, the genders, ages and income levels of the residents were incorporated into the analysis as control variables. Gender was taken as a dummy variable, which equals 1 for male and zero if otherwise. Age was a six-category scale for the resident's age (1 = 18–24 years old; 2 = 25–34 years old; 3 = 35–44 years old; 4 = 45–54 years old; 5 = 55–64 years old; 6 = 65 years old or above). Income was a six-category measure of the resident's average monthly income (1 = below HKD 10,000; 2 = HKD 10,000–19,999; 3 = HKD 20,000–29,999; 4 = HKD 30,000–39,999; 5 = HKD 40,000–49,999; 6 = HKD 50,000 or above).

3.2. Survey Instrument

Primary data were collected via a structured questionnaire survey for the measurements of *ASB*, *PN*, *CD* and *ME*. For this purpose, a questionnaire was custom-made. To align with the concepts and measures adopted in the international literature, the questionnaire was first designed using English. The back-translation technique was then employed to translate the questionnaire into Chinese. The English-version and Chinese-version questionnaires were pre-tested by five native English speakers and five native Cantonese (the most commonly used Chinese dialect in Hong Kong) speakers, respectively, before finalization. The start of the official survey followed the fine-tuning of the questionnaire in response to the testers' feedbacks.

3.3. Sampling Strategy and Survey Execution

A multi-stage sampling approach was adopted for the selection of the target participants in the survey. In the first stage, 17 private housing communities, with residential towers taller than 15 stories, in Tseung Kwan O, Hong Kong were randomly sampled. Tseung Kwan O was chosen because it was a new town with a good mix of private housing communities in terms of class, scale, building age and ownership rate. In the second stage, a list of all housing units in these 17 high-rise housing communities was compiled. Not less than 15% of the housing units in each of these communities was randomly sampled for data collection. The final sampling frame consisted of a total of 3000 housing units. An invitation card was mailed to each of these sampled units to invite the respective household heads to partake in a self-administered online questionnaire survey. The questionnaire was put on the web-based survey platform Qualtrics®. Each invitation card contained a quick response code with which the invitee could access the online survey. One of the merits of using the Qualtrics® platform is that the internet protocol addresses of the survey participants could be checked to exclude duplicate responses. To push up the response rate and encourage forthright and accurate responses from the residents, it was emphasized in the invitation card that participation in the survey was totally voluntary and anonymous.

3.4. Profiles of the Housing Communities and Survey Respondents

Table 1 summarizes the characteristics of the 17 private housing communities sampled for investigation. The ages of the housing communities ranged from 2 years to 26 years, so the sample included a good blend of new and old housing estates. The development scales also varied a great deal. The average percentage of renters in the housing community was 15.5%. Using the finalized questionnaires, the collection of primary data for this study was performed between December 2017 and August 2018. Upon three rounds of invitation, a total of 632 responses were received, representing an overall response rate of 21.1%. Among these 632 responses, 592 were complete and valid. These 592 responses were eventually included in subsequent data analyses. As shown in Table 2, for these 592 valid responses, over 70% of the respondents were male. The dominant age group of respondents was 45–54 years.

Table 1. Profile of the sampled private housing communities ($n = 17$).

Characteristic	Maximum	Mean	Minimum	σ
Age (Years)	26	13.6	2	9.4
Total Number of Housing Units	5726	1488.2	372	1300.2
Percentage of Renters (%)	32.3	15.5	2.1	8.7

Table 2. Profile of the valid respondents of the survey ($n = 592$).

Characteristic	Count	Percentage (%)
Gender	Male	420
	Female	172
Age	18–24 years old	24
	25–34 years old	66
	35–44 years old	163
	45–54 years old	232
	55–64 years old	82
	65 years old or above	25
Income	Less than HKD 10,000	6
	HKD 10,000–19,999	53
	HKD 20,000–29,999	118
	HKD 30,000–39,999	234
	HKD 40,000–49,999	136
	HKD 50,000 or above	45

4. Findings, Analysis Results and Discussion

4.1. Validity and Reliability Tests

A confirmatory factor analysis (CFA) was conducted to test the validity and reliability of the individual-level constructs. Test results of the CFA, which were shown in Table 3, indicated a good model fit ($\chi^2/df = 1.89$, and CFI = 0.98). All items had an estimated loading exceeding 0.50 and were statistically significant at the 5% level. Accordingly, the results of CFA supported the convergent validity of all the measures. The values of composite construct reliability (CCR) for all four individual-level constructs were 0.83 or higher. They were all greater than the widely accepted cut-off value of 0.70. Moreover, all alpha values (α) exceeded 0.70, confirming internal consistency reliability. At the same time, the values of average variance extracted (AVE) for the four constructs were higher than the 0.50 cut-off, indicating the convergent validity of the underlying measures of all constructs. Table 4 presents the summary statistics of the operationalized constructs and inter-correlations among them. For each construct, discriminant validity was assured because the correlation coefficients between it and other constructs were not greater than the square root of the construct's AVE.

Table 3. Results of validity and reliability tests.

Scale Item	Loading	α	CCR	AVE
Perceived Level of ASB (ASB)		0.83	0.83	0.64
Noise	0.84			
Pet nuisance	0.66			
Neglected water seepage or dripping	0.73			
Littering	0.75			
Abusiveness of common areas	0.69			
Graffiti, fly-posting and vandalism	0.65			
Harassment and intimidation	0.62			
Poor Neighborliness (PN)		0.92	0.93	0.66
I live in a close-knit community.	0.65			
I can trust my neighbors.	0.69			
My neighbors get along well.	0.79			
My neighbors' interests and concerns are important to me.	0.81			
If there were a serious problem in my community, the residents would get together to solve it.	0.68			
Community Detachment (CD)		0.85	0.87	0.56
This is the ideal housing community to live in.	0.66			
Now this housing community is a part of me.	0.79			
There are places or people in the housing community to which I am very emotionally attached to.	0.77			
I would not willingly leave this housing community for another.	0.75			
Management Efficacy (ME)		0.89	0.90	0.58
My property management agent is competent in controlling ASB in my housing community.	0.89			
My property management agent is knowledgeable in building management.	0.78			
My property management agent is willing to get involved in neighbor disputes in my housing community.	0.79			

Notes: $\chi^2/df = 1.89$; CFI = 0.98; NNFI = 0.97; RMSEA = 0.03; SRMR = 0.03.

Table 4. Summary statistics of the variables and correlation matrix.

Variable	Mean	σ	1	2	3	4	5	6	7
1. Gender	0.71	0.45							
2. Age	3.60	1.11	−0.05						
3. Income	3.97	1.09	−0.04	0.29 ¹					
4. PN	2.48	0.89	−0.11 ¹	0.04	−0.11 ¹				
5. CD	2.58	0.93	−0.04	0.05	−0.03	0.54 ¹			
6. ME	2.61	0.95	−0.03	0.04	−0.05	0.40 ¹	0.46 ¹		
7. ASB	2.32	0.88	−0.02	0.05	−0.08 ²	0.45 ¹	0.58 ¹	0.31 ¹	
8. LOR	0.15	0.09	−0.04	−0.03	0.01	0.34 ¹	0.38 ¹	0.22 ¹	0.32 ¹

¹ $p < 0.01$; ² $p < 0.05$.

4.2. Results of Hierarchical Linear Modeling

For hypothesis testing, the data were analyzed using the technique of hierarchical linear modeling (HLM). HLM was employed because there were two levels of variables in this research. Residents’ perceptions of poor neighborliness, community detachment and management efficacy were individual-level variables, while the level of renting in a housing community was a neighborhood-level variable. The cross-level hypotheses were tested using HLM. First incepted in the 1970s and later promoted by Bryk and Raudenbush (1992), HLM is regarded as a statistical technique “that allows researchers to examine relationships involving predictors at two or more levels and an outcome at a single level, generally at the lowest level represented by the predictors” (Gavin and Hofmann 2002, pp. 15–16). HLM estimation is conceptually similar to the ordinary least squares (OLS) method, except that there are two levels of model estimation in HLM. At the first level, relationships between the individual-level predictors and individual-level dependent variables are analyzed in a within-group model. At the second level, between-group models are analyzed to estimate the variances in the intercepts and slopes, and cross-level interactions, i.e., the moderation effects (Hofmann 1997). The analysis results of HLM are exhibited in Table 5. The respondents’ gender, age and income were controlled in Model I. Model II included all individual-level variables only, and both individual-level and neighborhood-level variables were incorporated in Models III and IV. The main difference between Models III and IV is that Model III was an intercept-as-outcomes model, which examined the direct effect of the neighborhood-level variable, while Model IV was a slope-as-outcomes model, which evaluated the cross-level interactions.

Table 5. Results of HLM analyses.

	Model I	Model II	Model III	Model IV
Intercept	2.22 ¹	2.28 ¹	2.27 ¹	2.27 ¹
Individual Level				
Gender	−0.02	0.04	0.04	0.03
Age	0.06	0.02	0.02	0.01
Income	−0.02	−0.02	−0.03	−0.02
PN	−	0.09 ¹	0.09 ¹	0.09 ¹
CD	−	0.14 ¹	0.14 ¹	0.15 ¹
ME	−	0.02	0.02	0.03
Neighborhood Level				
LOR	−	−	0.87 ²	0.87 ²
Cross-level Interactions				
PN × LOR	−	−	−	0.11 ²
CD × LOR	−	−	−	−0.04
ME × LOR	−	−	−	−0.03
Deviance	1499.77	1288.55	1271.32	1266.94
Pseudo R ²	0.02	0.27	0.31	0.33

¹ $p < 0.01$; ² $p < 0.05$.

The HLM results indicated that poor neighborliness and community detachment positively influenced the residents' perceived levels of ASB seriousness ($p < 0.01$ in Models II–IV). On the other hand, management efficacy did not have any significant impact on ASB. As for the housing tenure mix, the HLM results revealed a significant positive relationship between *LOR* and *ASB* ($p < 0.05$ in Models III and IV). In other words, a higher level of ASB seriousness was perceived when renters represented a higher proportion of a housing community, supporting *H1*. As far as the cross-level interactions are concerned, the level of renting had a significant moderating effect on the relationship between poor neighborliness and ASB seriousness ($p < 0.05$ in Model IV), supporting *H2*. Nevertheless, no significant moderating effects of *LOR* on the *CD-ASB* and *ME-ASB* paths were found. *H3* and *H4* were thus rejected.

4.3. Discussion

The analysis results indicated that residents in a private housing community with a higher proportion of renters generally perceived a higher level of ASB proliferation, keeping other things constant. Through conceptualization and empirical testing of the role of housing tenure mix in shaping ASB proliferation, this study contributes to research on housing-related ASB in the high-rise context. On one hand, a higher level of renting in a private high-rise housing community seems to stimulate a more serious ASB problem. On the other hand, the level of renting was found to strengthen the relationship between poor neighborliness and ASB proliferation. These findings may justify the tenure stigma put on renters (Dreier 1982; Rollwagen 2015). A higher level of renting could mean a higher degree of population turnover in a housing community (Arthurson 2013). High degrees of resident mobility weaken community stability, stimulating ASB proliferation both directly and indirectly. Moreover, the research findings lend support to the social disorganization theory put forward by Shaw and McKay (1942). The social disorganization theory postulates that the capacities of disadvantaged neighborhoods, with weak social networks and a high degree of residential mobility control of social disorders, are poor. This postulation was supported by the empirical findings of this research, as poor neighborliness and community detachment were found to be significant contributors to ASB seriousness. Perhaps, the collective efficacies of the local communities with poorer neighborliness and a weaker community attachment in curbing ASB tended to be lower. These collective efficacies were further weakened by the increasing levels of renting in the housing communities. Generally speaking, the analysis results suggested that housing communities with higher proportions of renters were less resilient in the context of ASB control. Housing tenure mix played a pivotal role in shaping residents' perceptions of ASB seriousness in high-rise private housing communities in Hong Kong, though this is not to say other socio-structural determinants of ASB proliferation can be disregarded.

The findings of the present research have significant and far-reaching implications for policy-makers and housing professionals in ASB management. First, the level of renting, poor neighborliness and community detachment were evidenced as contributors to ASB proliferation in housing communities. With these identified determinants of ASB seriousness, policy-makers and housing managers can identify which housing communities are potentially more problematic or difficult to manage, for better-informed decision making. Not many types of ASB in a housing community are readily observable within a short time period. ASBs like noise nuisance and harassment may be observable through one's prolonged stay in the housing community. PMAs can appraise if a particular housing community is prone to an ASB problem in advance, by looking into those exogenous or external factors, so they can allow more resources in their proposed budgets to deal with the ASB problem (say, with more staffing expenses) in the tendering exercise for a housing management service contract. In terms of portfolio management or housing stock management, PMAs and policy-makers can effortlessly identify communities with higher risks of proliferation earlier, based on those predicting factors. This prediction allows early identification or warning, for the PMA's or government's more rational allocation of resources for tackling the ASB problem among housing communities in the stock.

In addition, the research findings may offer some insights for the housing managers into how to find ways to cope with the ASB problem, or the residents' perceptions of ASB seriousness at least, in the housing communities they are managing. As suggested by the analysis results, the PMAs can lower residents' perceptions of ASB seriousness through controlling the latter's senses of neighborliness and community attachment. This end is achievable by various means. For example, neighborliness can be fostered by organizing more social activities (like competitions, gatherings and outings) or neighborhood events, for friendship development and social network building among residents (Yau 2014). Inductions, orientations or welcome parties can be provided for new residents moving into a housing community. Apart from the software, the hardware of housing communities can be improved in order to promote social interactions among residents. For instance, more communal space within in a housing community should be allowed in the planning and design stage. Moreover, active resident participation in housing management affairs should be promoted, as it can cultivate positive community relations and thus help to ease ASB (Karim and Rashid 2017).

5. Conclusion, Limitations and Agenda for Future Research

In this study, a framework was developed to probe the effects of housing tenure mix and other social factors on the perception of ASB seriousness. Census and survey data collected in Hong Kong were analyzed using the HLM technique. The analysis results divulged that perceived ASB seriousness was shaped by poor neighborliness, community detachment and the level of renting. As a moderator, the level of renting also enhanced the influence of poor neighborliness on perceived ASB seriousness. The findings of the research have advanced the literature on ASB management by elaborating the role of housing tenure mix in ASB proliferation. The research findings could assist policy-makers and housing managers in making more informed decisions when dealing with housing-related ASB.

However, this study is subject to a number of important caveats. First, the inquiry was delimited to private housing communities in one single district in Hong Kong (namely, Tsueng Kwan O) only. More data should be collected from other districts in the city, and also other Asian cities, to further test the generalizability of the research findings. Second, it is acknowledged that the level of ASB seriousness can be operationalized differently. In the current research, a subjective individual-level measure is used for gauging ASB seriousness. Although this measure may be criticized for its subjectivity, it fits the current study best because it is believed that perception is a more relevant construct, shaped by poor neighborliness and community detachment. Yet, future research could make use of objective neighborhood-level measures of ASB seriousness if data were available. Third, this study is a pioneering attempt to scrutinize how housing tenure mix impacts ASB proliferation in a high-rise residential setting in Asian cities. In-depth qualitative research could further examine the disparities in ASB proliferation across housing communities with different levels of renting. Lastly, I am aware of the possible link between ASB or minor civilities and serious crime under the "broken window thesis". Nonetheless, serious crime was not included in the current study. The exclusion is mainly because I would like to have a sharper focus on the social determinants of ASB proliferation, which is a relatively underexplored area. Further, the relevance of the "broken window thesis" to the highly gated residential settings in the east is doubtful. Therefore, I would recommend that further research on how housing tenure mix shapes crime perception or fear of crime via ASB perception is warranted. Moreover, further studies should be dedicated to investigating if ASB proliferation is dependent on the level of gatedness of a housing community.

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