

PREDICTORS OF POOR CONDITIONS IN THE HOME

by

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Abstract

Despite popular media portraying hoarding to be a problem of extremely poor housekeeping, most hoarded homes are relatively clean – large amounts of stuff just prevent the home from being functional. Some hoarded homes, however, develop poor living conditions like filth or disrepair. To date, little is known about how homes end up this way. The current study identified unique predictors and generated ideas about complex processes involved in the development of poor living conditions in hoarding.

Three community agencies shared in-home assessment data for mainly involuntary clients with problematic living conditions, such as hoarded or filthy homes. These community agencies were the Metropolitan Boston Housing Partnership (n=115) in Boston, MA, the Hoarding Action Response Team (n=137) in Vancouver, BC, and the Hamilton Gatekeeper's Program (n=209) in Hamilton, ON. Each site completed in-home assessments from 2010-2014 to evaluate client characteristics (lack of insight, social isolation, state of mind) and conditions of the home (number of pets, clutter accumulation, unusable bathrooms or kitchens) using the HOMES: Multidisciplinary Hoarding Risk Assessment, the Clutter Image Rating Scale, or a similar measure.

Site-specific regression analyses identified unique predictors of poor living conditions. Clients with high clutter accumulation were at increased risk for squalor at all three sites, while kitchen or bathroom problems uniquely predicted squalor at two sites. Within two agencies, number of pets was also a consistent predictor of one indicator of squalor, the presence of urine or feces. Few clients had household disrepair (9-12% within sites), but findings hint that disrepair is associated with high clutter accumulation. Findings related to poor insight being a predictor of squalor were mixed.

This is the first study to directly examine poor living conditions in hoarding. Replicated study findings across sites suggest that common features of hoarding, such as clutter accumulation and unusable rooms, are unique predictors for squalor. Results from this study can help community agencies that deal with problematic living situations prioritize intervention goals, especially if staff believe clients are at risk for poor living conditions.

Lay Summary

Although most hoarded homes are relatively clean, some develop poor living conditions like filth or disrepair. To date, little is known about how homes end up this way. The current study identified unique predictors and generated ideas about processes involved in the development of poor living conditions in hoarding. Three North American community agencies shared in-home assessment data for mainly involuntary clients with problematic living conditions, such as hoarded or filthy homes. Each site completed in-home assessments to evaluate client characteristics and living conditions. Study findings replicated at multiple sites suggest that both high clutter accumulation and kitchen or bathroom problems uniquely predicted squalor. Number of pets was also predictive of one specific indicator of squalor. Study findings also hinted that disrepair might be related to extreme clutter accumulation. These findings help explain how squalor fits into hoarding and have direct implications for community agencies that address problematic living conditions.

Preface

In collaboration with my advisor, Dr. Sheila Woody, I am responsible for generating research questions from the available dataset, data cleaning, analysis, and authorship of the work presented in this thesis. The overall project was designed by Sheila Woody, Christiana Bratiotis, and Nathanael Lauster. Sheila Woody was also responsible for securing funding and obtaining access to in-home assessment data collected by staff from the Metropolitan Boston Housing Partnership, the Hoarding Action Response Team, and the Hamilton Gatekeepers Program. Two research assistants helped collect and clean the data.

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Introduction

Although popular media leaves the impression that hoarding is a problem of shockingly poor housekeeping, most hoarded homes are relatively clean – they just have too many possessions to be functional. Keeping one’s home clean is undoubtedly more difficult if it is hoarded than if it is spartan, yet most people in hoarded homes do maintain basic standards of cleanliness. Some hoarded homes, however, have poor living conditions like squalor or neglect. Why? How did this come to be?

Living amidst squalor (filth) or an extreme state of disrepair not only puts the resident’s safety and health at risk, but also can affect the surrounding community. Yet, very little research has examined how these living conditions develop and no studies have identified potential risk factors. The purpose of the proposed study is to identify correlates and generate ideas about the development of poor living conditions within hoarded homes. This introduction will define relevant phenomena, such as hoarding and poor living conditions, and provide a review of the extant research. Potential contributing factors to the development of poor living conditions will then be discussed before presenting a rationale and method for the study.

To illustrate symptoms of hoarding disorder, consider a hypothetical scenario about Alicia’s living conditions:

Alicia is a widowed 62-year-old woman living in a subsidized one-bedroom apartment. She has always had difficulties parting with stuff. Over the recent years, she has noticed her unit has become increasingly cluttered. The most challenging items to part with are books, mail, receipts, and anything she thinks would be useful for the future. She also feels a strong sentimental attachment to her possessions, as they serve as reminders of happier times in her life.

Her home is so cluttered that the rooms are no longer functional. For example, the living room has been taken over by large piles of stuff to the point where she cannot sit and watch television. Alicia cannot open her front door very far before her possessions get in the way; she must turn sideways to go through the doorway. Her bedroom also has large piles on the floor and the bed, making sleep uncomfortable. Her kitchen is in a similar state, with minimal space to prepare and cook food. Due to embarrassment about her living conditions, Alicia has not let anyone into her home for two years. When asked how she feels about her home, she reports that clutter can sometimes get in her way, but each item is useful and she is coping just fine.

Alicia's situation is an example of hoarding disorder, which is a newly defined category in the *Diagnostic and Statistical Manual of Mental Disorders – 5th Edition* (American Psychiatric Association, 2013). Although the official status of this diagnostic category is recent, the behaviour has been worthy of clinical interest for decades. Hoarding disorder prevalence rate estimations range from 2.3% to 5.8% in the general population (Iervolino et al., 2009; Mueller, Mitchell, Crosby, Glaesmer, & de Zwaan, 2009; Timpano et al., 2011). This disorder is characterized by persistent difficulties discarding items of seemingly limited value, as well as strong urges to save objects. As a result, extreme clutter accumulates and prevents rooms from being used in the way they were designed, which contributes to impairment and distress. Thus, the presence of excessive clutter alone would not be enough to diagnose an individual with hoarding disorder. Rather, the accumulation of clutter must be related to purposeful collecting and/or strong urges to save items. Passive accumulation due to mobility problems or cognitive deficits leading to an inability to take care of the home would not be considered hoarding (Maier, 2004).

Residents of hoarded homes can experience consequences that seep into various parts of their lives. Accumulated possessions prevent Alicia from both sleeping comfortably in her own bed and cooking food in her kitchen. Some hoarded dwellings fall into disrepair, lack basic utilities, and have issues with cleanliness. Furthermore, the presence of excessive combustible materials in Alicia's unit can pose a threat to her and her neighbours by elevating risks of fire. Alicia's social life has also been affected by extreme clutter, as she is too embarrassed to invite anyone over.

Poor Living Conditions

“Poor living conditions” is an umbrella term that refers to a failure to maintain basic living standards in the home (Dong, 2014). Poor living conditions include domestic squalor (e.g., filth, pests), structural degradation (e.g., caving walls, mold), or inadequate utilities (e.g., lack of heat or hot water). Consequences of poor living conditions go beyond health and safety for the individual resident; they also carry intense stigma and can lead to ostracism.

An important next step in research is understanding the development of poor living conditions and how this problem fits into hoarding. Despite obvious consequences of poor conditions in hoarded homes, research examining these living circumstances is scarce. I will now provide an overview of the squalor literature and discuss implications of household disrepair problems in hoarding.

Squalor

Although housekeeping is generally more challenging in hoarded homes, some homes become quite unsanitary, even squalid. Alicia's home demonstrates this complication:

Spoiled food has started to build up in Alicia's apartment because clutter prevents her from accessing the cabinet where she keeps her garbage bin. In addition, she finds it

hard to take the garbage out because the front door does not open wide enough. The spoiled food has attracted cockroaches and mice and Alicia's neighbours have complained about unpleasant odours from her unit.

Squalid homes have an accumulation of dirt, grime, or even human or animal waste (Snowdon, Halliday, & Banerjee, 2012). Pest infestations, rotting food, and foul odours, such as those found in Alicia's unit, are other indicators of squalor. Such conditions would be objectionable to most people in western societies due to concerns about the health and well-being of the resident. Furthermore, occupants of unhygienic homes have elevated risk for health complications due to infections and inhalation of biohazards (Homchenko, Lackie, Morse, & Scott, 2014). Importantly, squalor is independent of hoarding, as even non-hoarded homes can be squalid.

Moreover, filthy conditions are associated with high mortality rates (Norberg & Snowdon, 2014) and poor quality of life (Dong, 2014). In a review of research related to the course of squalor, Norberg and Snowdon (2014) concluded that death is a common outcome for older adults living in squalid conditions. This association may be due to a third variable such as dementia, which could, to a certain extent, account for both the development of squalor (Lebert, 2005) and high mortality rates (Mölsä, Marttila, & Rinne, 1986). Furthermore, considering the negative consequences of filth in the home, occupants living in squalid dwellings are more likely to require the attention of health and emergency services (Homchenko et al., 2014).

According to Herskovits and Mitteness (1994), living in a dirty environment does not fit with most cultural norms. In fact, throughout history the presence of dirt has carried many negative associations, such as lack of purity, disorder, and sin (Bushman & Bushman, 1988). An important part of home-making is managing cleanliness by separating waste from one's living

space (Angus, Kontos, Dyck, McKeever, & Poland, 2005). Neglecting these tasks may be interpreted as challenging cultural values about personal responsibility to prevent disease through care of one's environment (Herskovits & Mitteness, 1994). Although living in such conditions strongly contradicts how most people in western society maintain their homes, our understanding of why people live in filth is minimal. Potential factors related to the development of filthy homes will be discussed later in this paper.

The frequency of filthy homes in the general population seems to be rare. Investigating prevalence of domestic squalor is difficult, as residents living in these conditions are unlikely to volunteer for research and they tend to resist community interventions (Snowdon, Pertusa, & Mataix-Cols, 2012). However, Snowdon and Halliday (2011) were able to examine referrals to an old age psychiatry team in Australia over a 10-year period. They estimated prevalence to be at least 0.66% for seniors referred to this service. This rate is considered a lower bound for general squalor occurrences because occupants of squalid homes may have been referred to other services and many cases likely remain unreported. Notably, the overwhelming majority of studies examining squalor include adults in the older age range. Thus, our knowledge of squalor in other age groups is minimal. Even taking these limitations under consideration, Snowdon and Halliday's (2011) low prevalence estimations suggest that squalor may be a rare problem.

In contrast, the presence of squalor within hoarding does not appear to be rare. Findings from overlapping squalor and hoarding research suggest that approximately 29 – 38% of cases co-occur (Kim, Steketee, & Frost, 2001; Snowdon, 1987; Snowdon & Halliday, 2011). Considering the overrepresentation of domestic squalor within hoarding compared to the general population, hoarding and domestic squalor are likely related. Surprisingly, no studies to date have looked into this matter.

Understanding squalor in cluttered homes is imperative because filthy living conditions can pose additional barriers for providing services to clients who have problems with hoarding. Despite good intentions, common responses from people who enter squalid homes are feelings of repulsion and disgust. This reaction may prevent occupants from receiving adequate help or care from the community. McDermott and Gleeson (2009) reviewed community agency data collected from 208 persons referred and assessed for squalor-related issues. Of the clients approved to receive additional help, 71% were denied services from the team because of occupational health and safety concerns for the workers who would enter the home. This high rejection rate indicates that many residents of both hoarded and filthy homes are unlikely to receive help from community agencies, despite the urgency of these cases.

Household Disrepair

Another complication of hoarding disorder may involve household disrepair, such as structural degradation and lack of basic utilities. Alicia's dwelling highlights some of these problems.

Alicia's living room lights stopped working a month ago. She is not sure if the lightbulb burnt out or if an electrical problem exists, as she cannot get to the light fixtures due to the amount of stuff piled in the room. Earlier this year, Alicia noticed the stream of water from her kitchen faucet getting thinner and weaker than previous years. Since then, less and less water seems to come out of the faucet, to the point where it can take a full minute just to fill a cup of water. Alicia has not told the building manager about the water problem because she is afraid of what will happen if he knows how her unit looks and she can see there is no space for anyone to conduct repairs due to all of

her belongings. Alicia cannot clear this space because there is nowhere else to move the items.

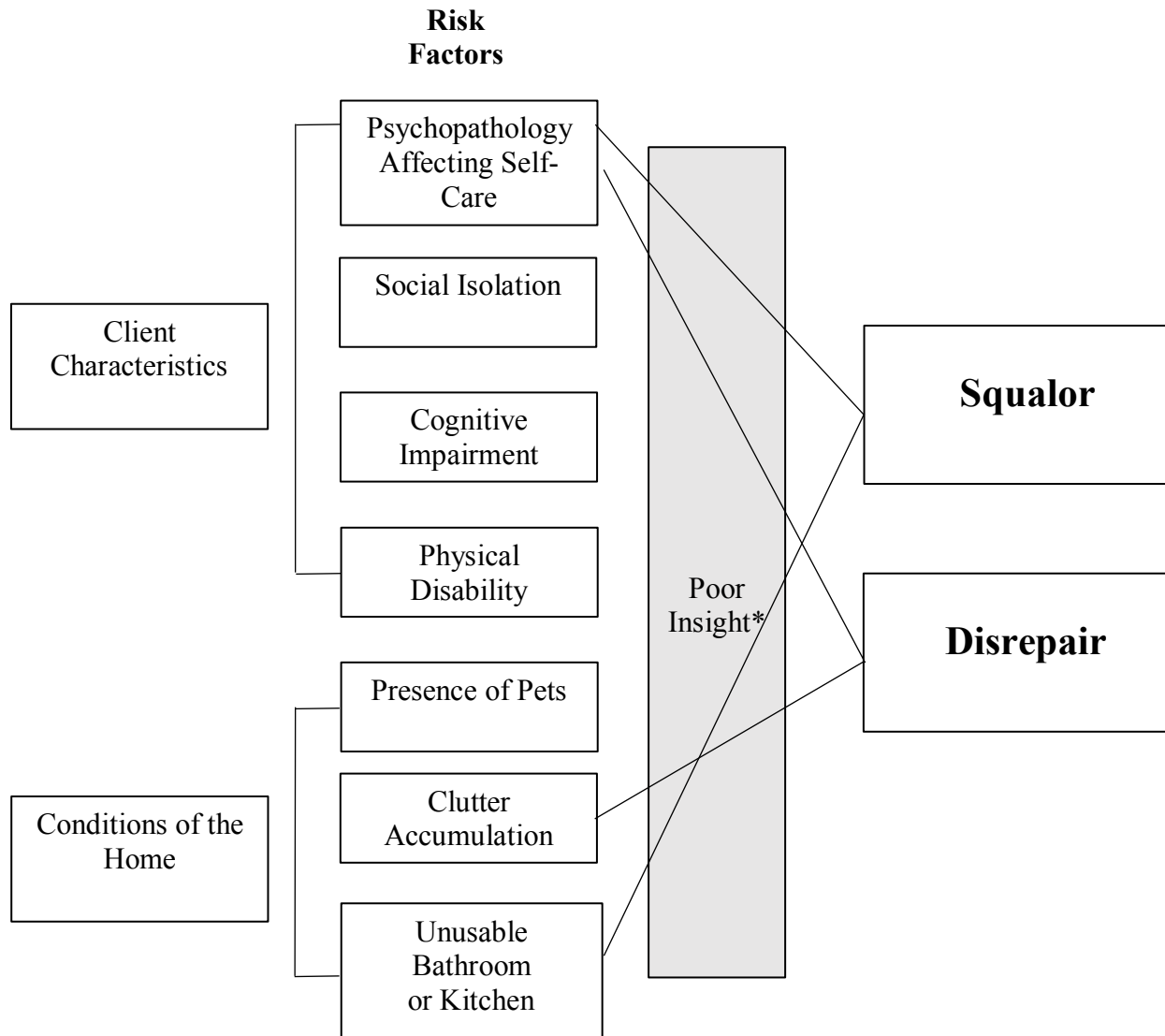
As demonstrated by Alicia's dwelling, home maintenance is another important consideration in hoarded conditions. Extreme accumulation of clutter can restrict access to certain areas of the home, creating obstacles to identifying problems and conducting regular repairs. Such neglect can lead to structural, plumbing, and electrical problems. Moreover, these household maintenance problems can pose safety risks (e.g., caving walls, damaged floorboards) and impact everyday activities (e.g., cleaning, cooking, and bathing). If residents do recognize a problem and ask for help, finding professionals who can tolerate and perform maintenance and repairs in extremely cluttered conditions can be challenging. Despite the concerns raised by dilapidation, disrepair of the home has received even less attention in the literature than domestic squalor and hoarding. Studies that directly examine poor living conditions and its relation to hoarding will fill a much-needed gap in the literature.

Contributors to Poor Living Conditions

Poor living conditions can exacerbate common household problems. For example, consider a scenario where a home has a mice problem, something that has been self-reported to happen at one time or another in up to one-third of American homes (National Pest Management Association, 2016). Mice can carry bacteria, disease, parasites and viruses. Furthermore, rodents can also damage property, as mice can chew through drywall and electrical wires. Locating and eradicating mice within a home is typically quite difficult and professional exterminators are often required. However, effective extermination is challenging in hoarded homes due to the disorganized piles of possessions.

Figure 1 illustrates a theoretical model about how squalor and disrepair develops. The rest of this section will go through the model to describe factors that may be related to poor living conditions. Although each of these factors will be explained below, only a subset of the model was examined in the current study.

Figure 1. Theoretical Model for Squalor and Disrepair



Note. Poor insight is a necessary risk factor but insufficient by itself in developing squalor and disrepair.

Poor insight is essential to the theoretical model of poor living conditions presented in Figure 1. Lack of insight, or an inability to recognize the degree to which poor living conditions represent a problem, naturally means that residents will not be motivated to change their circumstances. The presence of poor insight, however, is likely necessary but insufficient by itself for the development of squalor. Therefore, inadequate recognition of poor conditions, in combination with other risk factors in Figure 1, is likely a key element involved in household uncleanliness and disrepair. Residents with good insight who experience any of the risk factors in Figure 1 (e.g., clutter accumulation, physical disabilities) would likely prevent poor conditions simply by recognizing a downside in household maintenance and acting before a serious problem develops. On the other hand, residents who fail to recognize the development of filth and disrepair may not feel the same urgency to take action. Thus, specific risk factors (e.g., physical disabilities, number of pets) in combination with lack of insight could accelerate the development of poor living conditions or exacerbate existing problems.

Past research provides some support to the idea that lack of insight is associated with poor home conditions. Gregory and colleagues (2011) assessed insight levels in a multiple case-study of six older adults referred to a community agency for squalid living conditions. The researchers assessed insight and awareness in participants' judgments about pictures of domestic squalor. Five out of six participants recognized severe domestic squalor in newspaper photographs and even expressed concern for individuals who lived in these homes. In contrast, participants did not recognize their own poor living conditions. These observations provide preliminary hints that squalor-dwellers are aware of household cleanliness levels for others, but may lack recognition for their own dwellings. More research, however, is required to understand the role of insight in squalor, particularly whether poor insight leads to squalor or if squalor leads

to poor insight as a coping strategy. For example, residents could be unaware of gradually declining household hygiene, which could accelerate the development of squalor. On the other hand, squalor could precede poor insight, as being unable to recognize the filth could help residents tolerate living in an unhygienic home.

One risk factor for poor living conditions in the theoretical model is certain types of *psychopathology*, specifically disorders that involve apathy or indifference to self-care. Although few studies have systematically assessed individuals who live in poor conditions, extracted data from case reports and case series hint that at least half of referred individuals have met criteria for a mental disorder (Snowdon, Shah, & Halliday, 2007). The most common of these disorders include alcohol use and psychotic disorders (Snowdon et al., 2007). Alcohol or substance use disorder may lead to domestic squalor because the effects of the substance may impair decision-making and can contribute to decreased concern about oneself and others. Furthermore, persons with psychotic symptoms may experience domestic neglect because of preoccupations or diminished interest in understanding the way their behaviours affect themselves or others (Snowdon, 1987). Severe depression symptoms may also contribute to neglected households through indifference to self-care.

One aspect of *social isolation*, namely living alone or having no visitors, might also be related to the development of poor living conditions. Living with others may buffer the development of poor living conditions, as cohabitants can directly intervene when squalor and disrepair becomes apparent. Additionally, the prospect of visitors may provide motivation for maintaining clean and functional spaces for socializing in the home. Following this logic, residents who are socially isolated are likely at higher risk for poor living conditions than those with regular visitors in the home.

Poor living conditions may be linked to *impaired cognitive functioning*, another risk factor shown in Figure 1. Several studies have investigated executive functioning impairments in individuals living in poor conditions, suggesting problems in areas such as decision-making, motor sequencing, working memory, verbal fluency, and planning (Aamodt, Terracina, & Schillerstrom, 2015; Gregory, Halliday, Hodges, & Snowden, 2011; Schillerstrom, Salazar, Regwan, Bonugli, & Royall, 2009). However, none of these studies included age-matched comparison groups of individuals who do not live in a state of squalor or household neglect. Furthermore, the sample sizes in these studies were relatively small. Importantly, the majority of participants across these studies had dementia, so observations of cognitive impairment within these samples is unsurprising. Moreover, none of these studies examined young or middle-aged adults. These problems with sample selection bias undermine confidence in findings that hint at potential links between squalor and cognitive impairment.

Returning to Figure 1, squalor may be related to *physical inability* to clean and maintain the home. Poor vision, limited mobility, or being bed-ridden may lead to passive accumulation of dirt, grime, and waste materials. Snowden and Halliday (2011) examined 173 cases referred for squalor-related problems and found that 6% of the sample received a primary diagnosis of physical disability or illness. However, the number of clients with non-primary diagnoses of physical disability was unclear, making it difficult to know how many clients struggled with physical limitations overall. The presence of physical disabilities, especially ones that affect the senses (e.g., vision and smell), may put individuals at risk for poor living conditions, as these problems may interfere with recognizing household neglect.

Household cleanliness and repairs may also be impacted by the *presence of pets* within the home. Domestic animals can potentially accelerate the development of squalor or exacerbate

current household cleanliness problems. Responsible pet owners provide consistent and regular care for themselves and their pets to maintain the home. However, if residents neglect their pets, unsanitary conditions are likely to occur quickly. Furthermore, unsupervised pets could damage household appliances, worsening problems with disrepair. Thus, when pets are present, the accumulation of filth and possibly disrepair would likely be accelerated.

Continuing along the theoretical model, excessive clutter accumulation could also be a risk factor for poor living conditions. Repercussions of clutter differ depending on the individual, but can include restricted access to specific rooms and spaces necessary for home maintenance and repair (e.g., electrical wiring, furnace, water pipes). If certain areas are blocked off or items cannot be moved because there is nowhere else to put them, maintaining the home can become next to impossible. Also, clutter accumulation might potentiate some of the other risk factors in Figure 1, such as physical disabilities or depression, as high volumes of stuff could make taking care of the home even more difficult than usual.

The development of squalor in hoarding may also relate to *unusable kitchens or bathrooms*, the last risk factor in the theoretical model. Both bathrooms and kitchens are essential for basic hygiene and could become hazardous to one's health if maintained improperly. If these rooms are unusable due to inaccessibility or disrepair, consequences may include severe domestic squalor. According to Frost and colleagues (2000) and a report completed by the Metropolitan Boston Housing Partnership (MBHP, 2015), problematic clutter in bathrooms is infrequent. This finding suggests that bathrooms may be one of the last rooms to become cluttered in hoarded homes. Given that most hoarding clients live in hygienic conditions, assessing unusual behaviours among hoarding-disordered individuals, such as cluttered bathrooms, may provide clues about how severe unsanitary conditions develop. Accordingly, I

posit that the presence of squalor can be predicted by the extent to which kitchens and bathrooms are nonfunctional and inaccessible within hoarded homes.

The psychological impact of living in poor conditions should also be considered. Returning to the example of Alicia, she stopped hosting guests because she was embarrassed about her living situation. Furthermore, Alicia did not want to call someone to look at her disrepair problems because she feared what would happen if her living situation were discovered. Her actions may reflect the presence of stigma and shame about her household conditions. Undoubtedly, her concerns about what others think about her living situation could have a psychological toll over the long term. For instance, these psychological consequences could manifest through open expressions of anxiety, anger, defensiveness, or confusion when residents interact with others, especially those who are attempting to intervene to improve conditions in the home.

In summary, contrary to popular media portrayals, hoarding and poor living conditions do not seem to go hand-in-hand. However, previous findings estimate that approximately one third of hoarded homes are filthy, suggesting that squalor and hoarding may be separate but related constructs. Despite this relationship, research on squalor and on hoarding has developed along separate lines. Understanding links between these two phenomena could enhance understanding of poor living conditions and hoarding independently, as well as provide hints about how they fit together.

Current Study

The goal of this research was to gather clues about processes involved in the development of poor living conditions in hoarding. Correlates and predictors of poor living conditions were identified using client data from community agencies that worked with residents living in

problematic conditions. The three diverse community agencies were located in major cities across North America – Boston, Vancouver, and Hamilton. In contrast with most previous hoarding studies, which have involved research volunteers, this current study examined mainly involuntary clients who were not seeking intervention and were not research volunteers. On top of that, human service professionals assessed clients in their homes and recorded information about household conditions. Having access to this atypical research population provides a rare glimpse into the homes of individuals who are usually off-limits to researchers.

Specifically, I will examine the extent to which some of the factors in Figure 1 relate to poor living conditions using site-specific analyses. An advantage of completing analyses separately for each site is that replication is built in to the study design. Indeed, if certain findings are consistent across multiple sites, more confidence can be given to those results than other significant findings that were found at only one site. Based on the available data, variables of interest included client characteristics (e.g., lack of insight, social isolation, state of mind, income) and conditions of the home (e.g., number of pets, clutter accumulation, unusable kitchens or bathrooms). Unfortunately, no data were available on client cognitive impairment, psychopathology diagnosis, or physical disability.

Method

Participants/Data Sources

The Metropolitan Boston Housing Partnership (MBHP) is a housing advocacy organization based in Boston, Massachusetts. In 2012-2014, MBHP implemented a Hoarding Intervention and Tenancy Preservation Project and collected data from 115 clients. An Oak Foundation grant provided funding for this project. For the most part, MBHP provides services to clients who receive government rental subsidies. This population is especially vulnerable

because if residents lose their subsidies due to lease violations, such as hoarding and squalor, subsidies can never be regained. Thus, MBHP clients are at high risk of homelessness if an eviction occurs. Accordingly, MBHP's Hoarding Intervention and Tenancy Preservation Project was designed to prevent homelessness due to hoarding. Additionally, the project worked towards expanding knowledge of hoarding and translating this knowledge to housing professionals, public agencies, policy-makers, and the legislature. The project accepted general referrals from service providers and family members as well as self-referrals. A highly trained case manager engaged with residents long-term to help them achieve harm reduction targets and provided referral services. Once client homes were compliant with inspection standards and eviction was seen to be unlikely, follow-up visits were conducted to help prevent recidivism.

The Hoarding Action Response Team (HART) is a community-based intervention program located in Vancouver, British Columbia. The City of Vancouver and Vancouver Coastal Health jointly fund this team. HART's priorities are to help clients with hoarding-related problems maintain a safe home for themselves and their neighbours and to achieve this goal without eviction or prosecution. The HART team receives referrals from the general Vancouver hotline, completes in-home assessments, acts as an advocate for clients with hoarding problems, provides social support, and uses harm reduction interventions. Data were collected from 137 clients between January 2011 to April 2014. Within this time frame, the team was comprised of four members. Two Vancouver Coastal Health workers were responsible for residents' mental and social-wellbeing. A Vancouver Fire and Rescue Services fire inspector addressed residential safety and building regulations. Additionally, a City of Vancouver property use inspector focused on city by-laws and building regulations as well.

The Hamilton Gatekeepers Program is an initiative that works with community partners to identify older adults at risk for self-neglect. Financial support for this program comes from a range of government (municipal, provincial, federal) and non-profit (e.g., Diocese of Hamilton, United Way) sources. The goal of this Catholic Family Services program is to use client-centered approaches to prevent evictions, homelessness, and unnecessary hospitalization as well as increase health and safety for independently-living older adults. Clients are supported through case coordination, multi-disciplinary intervention, advocacy, problem solving, and long-term monitoring. This program is comprised of case managers and support workers with specialized training and support. Data obtained for this study were collected from 209 clients assessed by the Gatekeepers program during 2010-2014.

Procedure

Our research team formed partnerships with these agencies and was granted access to the agencies' datasets. Assessors from each community agency conducted in-home assessments with referred clients. Overall, assessments involved meeting with clients, building rapport and gaining voluntary cooperation, discussing the extent of hoarding problems, evaluating home conditions and client state, and developing plans for intervention and referrals.

Although each site was interested in similar overarching goals to help clients (e.g., improve quality of life, advocate for clients), the agencies had slightly different priorities during home assessments. For instance, MBHP assessors specifically evaluated clients' eligibility for other services, HART staff inspected the extent to which client homes violated building and fire regulations, and the Gatekeepers program sought to identify which programs clients could be referred to according to their needs.

Measures

Clutter Image Rating (CIR). The CIR is a widely-used tool to measure clutter volume (Frost, Steketee, Tolin, & Renaud, 2008; Tolin et al., 2010). This scale is comprised of nine photographs that depict a room in various states of clutter, beginning with a room that is as tidy as an empty hotel room (labeled “1”) and ending with clutter piled nearly to the ceiling (labeled “9”). According to Frost et al., the CIR has demonstrated high internal consistency ($\alpha = .84$), high test-retest reliability ($r = .82$), and high inter-rater reliability ($r = .94$). MBHP case managers provided clutter ratings for main living areas, such as the living room, kitchen, and bedrooms.

HOMES Multidisciplinary Hoarding Risk Assessment (HOMES). The HOMES was developed by the Massachusetts Statewide Steering Committee on Hoarding (*see* Bratiotis et al., 2011). Table 1 shows examples of items found on the HOMES checklist. This form helps assessors identify areas of risk in hoarded homes during brief initial assessments. Additionally, this checklist is useful for prioritizing problem areas and formulating plans for addressing these issues. This measure includes problems relevant to client characteristics (e.g., lack of insight, client mental state) and conditions of the home (e.g., cannot use bathtub/shower, garbage/trash overflow, caving walls). Assessments using the HOMES are completed by a human service professional in conjunction with a physical in-home inspection. To date, this measure’s reliability and validity have not been assessed. Both MBHP and HART inspectors completed these forms after conducting in-home inspections.

Gatekeepers Structured Intake Form. The Gatekeepers Program evaluated similar constructs using a structured intake assessment conducted in the home. Table 1 provides examples of items found on this intake form. Assessors recorded observations of client

characteristics (e.g., level of insight, degree of social connectedness to others) and conditions of the home (e.g., shower, bath, kitchen, electricity, squalor severity).

Furthermore, the Gatekeepers program case managers were qualified to evaluate hoarding symptoms. These assessors noted information according to four out of five questions from the Hoarding Rating Scale (Tolin, Frost, & Steketee, 2010), which were included on the structured intake form. These items asked assessors to rate the extent to which clients had trouble discarding ordinary items that were no longer in use, tendencies to excessively acquire possessions, feelings of anxiety and emotional distress because of clutter in the home, and the extent to which the clutter/problems discarding/excessive acquisition interfered with daily life. Based on these responses and observations during the in-home assessment, assessors provided hoarding severity ratings from 1-3, with “1” indicating little to no hoarding symptoms, and “3” indicating severe hoarding symptoms.

MBHP Structured Intake Form. MBHP also evaluated additional constructs using a structured intake form during home assessments. As can be seen from Table 1, the MBHP assessor provided indicators of client characteristics (e.g., friends or family inside or outside the home) and conditions of the home (e.g., presence of squalor).

Table 1*Examples of Sample Items Used to Measure Constructs of Interest by Site*

Construct	HOMES Item	MBHP Structured Intake Item	Gatekeepers Structured Intake Item
Poor Insight	Does not seem to understand seriousness of problem		Level of insight Rating from 1 (none) - 4 (fully aware)
Social Isolation		Friends or family inside the home? Friends or family outside the home?	Generally speaking, how would you describe your connection with other people in the community from 1 (very poor) – 5 (excellent)
Presence of Pets	# and kind of pets		Pets
Unusable Kitchen or Bathroom	Cannot use stove/fridge/sink; cannot access toilet; or cannot use bathtub/shower		Are any of the following inaccessible or not in working order? Stove; fridge; kitchen sink; toilet; shower/bathtub; or bathroom sink

Construct	HOMES Item	MBHP Structured Intake Item	Gatekeepers Structured Intake Item
Clutter Accumulation	Cannot sleep in bed	Clutter Image Rating Score	Hoarding Severity Rating from 1 (none) to 4 (severe)
Client State of Mind			
Anxious/ Apprehensive	Anxious or apprehensive		
Angry/Defensive	Defensive or angry		
Confused	Unaware, not alert, confused		
Squalor	Presence of spoiled food; presence of feces/urine (human or animal); presence of insects/rodents, presence of mold or chronic dampness; or garbage or trash overflow	Squalor Yes/No	Unhygienic Conditions Ratings from 1 (little or none) – 3 (severe)
Disrepair	Leaking roof; caving walls; no heat/electricity; no running water/plumbing		Are any of the following not in working order: Kitchen sink; electricity; furnace;

Construct	HOMES Item	MBHP Structured Intake Item	Gatekeepers Structured Intake Item
	problems; or unstable floorboards/stairs/porch		bathroom sink; toilet; shower; or water/heat

Data Analysis

Site-specific analyses were conducted to investigate the research questions. First, constructs from Figure 1 were identified across the three diverse community datasets. The availability of data differed depending on the agency; not all sites assessed all constructs. Furthermore, some constructs were measured differently across agencies. Where possible, cross-site differences on client characteristics and household conditions were examined. Next, site-specific univariate analyses indicated which constructs were related to poor living conditions. Significant findings from univariate analyses determined which variables were included in follow-up multivariate analyses to investigate predictors of poor living conditions. Within-site comparisons between individuals with and without bathroom problems were also conducted. Last, additional analyses were completed to further investigate unexpected findings.

Results

Client Characteristics

Table 2 shows information about continuous client characteristics for each agency. Notably, the Gatekeepers clients had a smaller variance for age compared to other sites because this program specifically serves older adults. A one-way ANOVA confirmed cross-site differences in client age $F(2, 201.9) = 52.08, p < .001$. Exploratory post-hoc tests examining specific age differences across groups indicated that MBHP clients represented the youngest

subsample, HART clients were significantly older, and the Gatekeepers served the oldest clients, $ps < .001$. Notably, age differences remained significant after accounting for unequal variance. Furthermore, after accounting for unequal variances, monthly income was similar between MBHP ($M = 1,524.20$, $SD = 1451.05$) and Gatekeepers clients ($M = 1,423.86$, $SD = 623.25$), $t(147.05) = 0.65$, $p = .52$.

Table 2*Continuous Client Characteristics Across Sites*

Measure	<u>MBHP</u>			<u>HART</u>			<u>Gatekeepers</u>		
	n	Mean	SD	n	Mean	SD	n	Mean	SD
Age	114	56.62	13.05	103	64.67	12.64	199	70.51	9.22
Monthly Income (\$)	106	1,524.20	1,451.05				91	1,423.86	623.25

Table 3 describes the percentages of categorical client characteristics at each site. Reflecting that MBHP worked mainly with clients who received government rent subsidies, chi square analyses indicated that MBHP had the most renters, followed by Hamilton and then HART, $7.42 \leq \chi^2 \leq 31.33$, $ps \leq .006$. For the same reason, MBHP clients were also at higher risk for eviction compared to Gatekeepers clients, $\chi^2(1) = 7.40$, $p = .007$. HART had more male clients than either MBHP, $\chi^2(1) = 3.88$, $p = .05$ or the Gatekeepers, $\chi^2(2) = 8.39$, $p = .02$, which did not differ from each other, $\chi^2(1) = 0.02$, $p = .88$. About 75% of clients in both the Boston and Hamilton samples lived alone, $\chi^2(1) = 0.56$, $p = .45$.

Table 3*Categorical Characteristics Across Sites (Percentages of Each Sample)*

Measures	MBHP	HART	Gatekeepers
Renters	85	51	66
Threats			
Loss of Housing Subsidy	63		
Risk of Eviction	53		28
Risk of Condemnation	15		
Previous Eviction	10		
Male	41	53	40
Living Alone	72		76
Currently Employed	12		
Unit Type			
Multifamily Building	72	65	69

Description of Variables

Each site was interested in similar constructs but often differed in data collection methodologies. Table 4 summarizes the percentages or means of variables that were hypothesized to be related to poor living conditions. I identified similar constructs across the three datasets and made efforts to ensure that less straightforward variables reflected the constructs of interest within the constraints of the datasets. A description of the constructs and variables of interest are described below.

Squalor. At MBHP, the structured intake form included a dichotomous notation of the presence of squalor. The MBHP assessor was a well-trained individual who was highly experienced with in-home assessments of hoarding and squalor. Because of his background and training, I had confidence that his assessments of squalor were valid.

HART data did not include explicit judgments of squalor. To address this problem, I decided to categorize HART clients as living in squalor if the assessor noted at least one squalor-related problem on the HOMES. Several analytic steps were taken to justify this rubric for squalor caseness. The HOMES has five variables related to squalor – the presence of spoiled food, garbage, pests, urine/feces, and mold. Factor analyses within each site confirmed that these 5 variables loaded onto one factor. Furthermore, this analysis provided factor scores for each client, which identified each client's placement or ranking on the squalor factor. Because the MBHP data had both the HOMES and an expert judgment of the presence of squalor, a Receiver Operator Characteristic (ROC) analysis was conducted in that dataset to identify the optimal HOMES squalor factor cut-off score for squalor caseness. The squalor factor analysis scores from the HOMES were submitted to the ROC analysis as the test variables (range = -0.78-2.48) and the squalor yes/no judgment was considered the gold standard measure. The optimal cut-off score was the presence of at least one squalor-related problem, which was a good balance between sensitivity (90%) and specificity (72%) in identifying individuals living in squalor. Accordingly, in the HART data, squalor caseness was determined by a positive finding for at least one of these squalor-related HOMES items.

The Gatekeepers structured intake included a rating for level of squalor from 1 (little or none) to 3 (severe). Similar to MBHP, these judgments were made on the basis of direct observation by highly trained and experienced staff.

Based on the indicators of squalor described above, cases of squalor occurred the most frequently at the Gatekeepers site (65% moderate or severe), followed by HART (50%), and then MBHP (35%). The sites all differed significantly in prevalence of squalor, $5.78 \leq \chi^2 \leq 24.99$, $ps \leq .02$.

Disrepair. For MBHP and HART, assessors recorded disrepair problems on the HOMES. Any problems noted by assessors for floorboards or stairs, roofs, walls, water, or heat were taken as indicators of disrepair. Gatekeepers clients were categorized as having household disrepair when assessors recorded that at least one of the following appliances/areas were not in working order: kitchen sink, electricity, furnace, bathroom sink, toilet, shower, or water/heat. As can be seen in Table 4. between 9-12% of clients within each agency had problems with disrepair, $0.02 \leq \chi^2 \leq 0.29$, $ps \geq .59$.

Poor Insight. Poor insight at MBHP and HART was indicated by assessors checking off the HOMES item *does not seem to understand seriousness of the problem*. On the other hand, Gatekeepers structured intake forms included an item where insight level was rated from 1 (fully aware) to 4 (none).

Social Isolation. The structured intake conducted at MBHP included information on social isolation, as indicated by the items *no friends or family inside the home* and *no friends or family outside the home*. A positive finding for both of these variables was taken as an indicator of social isolation for the present study. Assessors at HART did not collect data on social isolation, so this construct will not be analyzed for this site. In Gatekeepers, the closest indicator involved social connectedness; assessors asked clients to rate the extent to which they felt socially connected to others in the community from 1 (very poor) to 5 (excellent).

Assessors reported that 33% of MBHP clients did not have friends or family present inside or outside the home. The mean for Gatekeepers clients' social connectedness ratings was 3.54 with a standard deviation of 0.84.

Number of Pets. Assessors at all sites recorded the number of pets in the home.

Unusable Kitchen or Bathroom. The HOMES checklist allowed MBHP and HART assessors to note problems with access to functioning kitchens and bathrooms. Similarly, the Gatekeepers structured intake noted issues in the same areas. At all sites, any noted problems with the bathtub/shower, toilet, stove, fridge, sink, or preparing food were taken as indicators of unusable kitchen or bathrooms. Because both kitchen and bathrooms are likely essential for maintaining household hygiene, I combined these variables to decrease the chances of a Type II error.

Clutter Accumulation. MBHP assessors collected data on clutter accumulation in each room of the home using the CIR. The average of living room, bedroom, and kitchen ratings was used for analyses. The mean clutter rating for MBHP clients was 4.16 with a standard deviation of 1.63.

HART collected no data on clutter volume. To address this problem, I decided to use the indicator *cannot sleep in bed* from the HOMES as a proxy for the presence of high general clutter accumulation. HART clients are mainly individuals with severe hoarding problems, so if clients cannot sleep in their bed, general clutter is very likely to be the reason. A disadvantage of using this variable to indicate general clutter volume is that some clients might easily be able to sleep in their beds, while other parts of their home are still severely hoarded. However, in the MBHP dataset, being unable to sleep in the bed was positively and significantly correlated with CIR average scores, difficulties moving freely and safely in the home, the presence of unstable piles/avalanche risks, blocked or unusable egresses, exits, or vents, and inability of emergency personnel to enter/gain access to the home, $.19 \leq rs \leq .32$, $ps \leq .04$. Based on these statistics, an inability to sleep in the bed seemed to be a good indicator of general clutter. Assessors noted that 18% of HART clients could not sleep in their bed.

At the Gatekeepers site, the construct of clutter accumulation was represented by the assessors' 1 (none) to 4 (severe) ratings of hoarding severity, which was based on their overall impressions having completed a range of hoarding symptom items on the intake form. Because excessive clutter is an essential component of hoarding, I expect that high volumes of stuff would be reflected in these symptom severity ratings. The mean hoarding severity rating for Gatekeepers clients was 2.23 with a standard deviation of 1.04.

Monthly Income. Income might have implications for disrepair problems, as having extremely low income may interfere with residents' ability to address disrepair problems. Both MBHP and Gatekeeper assessors, but not HART assessors, noted client monthly income as part of their structured intake. For analyses that investigated the relation between monthly income and poor living conditions, I examined monthly income as a dichotomous variable, with clients falling either above or below federal poverty lines at MBHP (\$1,005.00 per month; Census Bureau, 2017) and at the Gatekeepers program (\$2,038.33 per month; Statistics Canada, 2011a). Notably, 47% of MBHP clients received incomes below the federal poverty line, whereas 87% of Gatekeeper clients also fell into the same category, a significant difference, $\chi^2(1) = 34.05, p < .001$.

Table 4*Percentages or Means for Variables Included in Univariate and Multivariate Analyses for All Sites*

Measure	<u>MBHP</u>		<u>HART</u>		<u>Gatekeepers</u>	
	<i>N</i>	Percentage or Mean (SD)	<i>N</i>	Percentage or Mean (SD)	<i>N</i>	Percentage or Mean (SD)
Living in Squalor / Squalor Rating	113	35%	137	50%	168	1.91 (0.78)
Living in Disrepair	115	10%	137	12%	171	9%
Lack of Insight	115	45%	137	50%	191	2.74 (1.04)
Number of Pets	111	0.38 (0.81)	137	0.27 (0.72)	189	1.19 (2.98)
Kitchen or Bathroom Problems	115	33%	137	42%	172	94%
HOMES Mental State						
Anxious/Apprehensive	115	38%	137	41%		
Angry/Defensive	115	32%	137	33%		
Confused	115	11%	137	16%		
Income Below Poverty Line	106	47%			91	87%

Note. In Gatekeepers, the range was 1 (little or none) to 3 (severe) for squalor severity and 1 (fully aware) to 4 (no insight) for insight.

MBHP

Squalor Correlation and Chi Square Analyses. Two-tailed Pearson correlation and chi square analyses were computed to assess relations between squalor presence and variables of interest. Table 5 summarizes percentages or means of analyzed variables for clients who were living in squalor in comparison to those who were not. Over half of MBHP clients who lacked insight (59%) had squalor present in the home, $\chi^2(1) = 74.61, p = .03$. Contrary to expectations, the presence of friends or family inside or outside the home was not associated with squalor, with 40% of clients with no friends or family living in squalor, $\chi^2(1) = 1.42, p = .23$. Number of pets did not differ for clients living in sanitary ($M = 0.38, SD = 0.92$) or squalid conditions ($M = 0.34, SD = 0.58$), $r(107) = .02, p = .82$. As expected, squalor presence was positively correlated with clutter accumulation as measured by CIR average scores, $r(108) = .42, p < .001$, suggesting that as clutter accumulation rose in the home, squalor presence was more likely. Furthermore, squalor was significantly related to kitchen or bathroom problems, with 65% of clients having both kitchen or bathroom problems and squalor, $\chi^2(1) = 22.42, p < .001$. Additionally, the presence of general disrepair was marginally associated with squalor, $\chi^2(1) = 3.15, p = .08$. In addition, most clients who did not seem anxious during the home visit lived in sanitary homes (70%), whereas 50% of overtly anxious clients lived in squalor, a significant difference, $\chi^2(1) = 7.65, p = .006$. Last, roughly half of clients who were noted to be angry, defensive, or confused lived in squalid conditions, but these mental states did not differ according to squalor status, $2.31 \leq \chi^2 \leq 2.43, ps \geq .12$.

Table 5*Percentages or Means of Variables Included in Univariate and Multivariate Analyses for MBHP**Clients by Status on Living in Squalor*

Measures	<u>Not Living in Squalor</u>		<u>Living in Squalor</u>	
	n	Percentage or Mean (SD)	n	Percentage or Mean (SD)
Lack of Insight	74	38%	39	59%
No Friends or Family	67	28%	35	40%
Number of Pets	71	0.38 (0.92)	38	0.34 (0.58)
Clutter Image Rating	71	3.95 (1.20)	38	5.48 (1.80)
Kitchen or Bathroom Problems	74	18%	39	62%
Disrepair	74	5%	39	15%
HOMES Mental State				
Anxious/Apprehensive	74	30%	39	56%
Angry/Defensive	74	27%	39	41%
Confused	74	8%	39	18%

Squalor Regression Analysis. Logistic regression was conducted to assess whether the four predictor variables (lack of insight, presence of bathroom or kitchen problems, client anxiety, and CIR average scores) uniquely predicted whether clients lived in squalor. The four predictors together significantly predicted squalor caseness, $\chi^2(4) = 36.41, p < .001$. As indicated by the Nagelkerke R^2 statistic, 39% of the variability in squalor presence was accounted for by the four predictor variables. Table 6 presents the odds ratios, which suggests that the risk of

squalor for MBHP clients increased by two- to five-fold if clients had high CIR average scores or unusable kitchen or bathrooms, respectively.

Table 6

Logistic Regression Predicting the Presence of Domestic Squalor for MBHP Clients, n = 109

Predictor	<i>B</i>	<i>SE</i>	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p</i>
HOMES Items					
Lack of Insight	0.61	0.49	1.84	[0.71, 4.79]	.21
Kitchen or Bathroom Problems	1.53	0.50	4.62	[1.74, 12.24]	.002
Anxious/Apprehensive	0.57	0.49	1.76	[0.61, 4.63]	.25
Clutter Image Rating	0.50	0.17	1.64	[1.18, 2.30]	.004

Disrepair Correlation and Chi Square Analyses. Two-tailed Pearson correlation coefficients and chi square analyses were conducted to examine relations between household disrepair and variables of interest. Table 7 summarizes the percentages or means for variables included in these analyses. Almost half of clients lacked insight, but unexpectedly, this did not differ according to disrepair status, $\chi^2(1) < 0.001, p = .99$. Furthermore, the presence of friends or family did not predict whether MBHP clients were living in disrepair, $\chi^2(1) = 2.58, p = .11$. In line with hypotheses, both number of pets and average CIR rating were positively correlated with disrepair problems, $r(109) = .19, p = .05$ and $r(110) = .41, p < .001$, respectively. Neither overt mental state nor living below the poverty line predicted disrepair status of the home, $0.06 \leq \chi^2 \leq 0.98, ps \geq .39$.

Table 7*Percentages or Means of Variables Included in Univariate and Multivariate Analyses for MBHP**Clients by Disrepair Status*

Measure	<u>Not Living in Disrepair</u>		<u>Living in Disrepair</u>	
	n	Percentage or Mean (SD)	n	Percentage or Mean (SD)
Lack of Insight	104	45%	11	46%
No Friends or Family	92	30%	11	55%
Number of Pets	100	0.32 (0.62)	11	0.82 (1.78)
Clutter Image Rating	100	4.33 (1.39)	11	6.44 (2.58)
HOMES Mental State				
Anxious/Apprehensive	104	39%	11	27%
Angry or Defensive	104	32%	11	36%
Confused	104	12%	11	9%
Income Below Poverty Line	96	46%	10	60%

Disrepair Regression Analysis. A logistic regression analysis was conducted to test the extent to which two predictor variables (number of pets and CIR average scores) uniquely predicted the presence of household disrepair. Considered together, both independent variables predicted disrepair presence significantly, $\chi^2(2) = 20.63, p < .001$. Based on the Nagelkerke R² statistic, 36% of the variance in disrepair was accounted for by number of pets and CIR average scores. As can be seen from Table 8, as CIR average scores or the number of pets increased, the risk of disrepair problems doubled.

Table 8*Logistic Regression Predicting the Presence of Household Disrepair for MBHP Clients, n = 111*

Predictor Variable	<i>B</i>	<i>SE</i>	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p</i>
Number of Pets	0.84	0.34	2.32	[1.20, 4.45]	.01
Clutter Image Rating	0.79	0.21	2.19	[1.46, 3.29]	<.001

HART

Squalor Correlation and Chi Square Analyses. Pearson correlations and chi square analyses were completed to evaluate relationships between squalor and the HART variables of interest. Table 9 summarizes the percentages or means of variables analyzed according to residents who were or were not living in squalor. Roughly half of clients lacked insight, but contrary to expectations, this did not differ according to squalor status, $\chi^2(1) = 0.36$ $p = .55$. Number of pets also did not differ for clients living in sanitary or squalid conditions, $r(135) = -.01$, $p = .93$. However, as expected, the majority of clients who could not sleep in their beds also lived in conditions that were judged to be squalid, $\chi^2(1) = 14.45$, $p < .001$, suggesting that excessive clutter was associated with squalor. Kitchen or bathroom problems also significantly predicted squalor status in the home $\chi^2(1) = 17.84$, $p < .001$. In contrast, the presence of general disrepair was not significantly associated with squalor presence, $\chi^2(1) = 2.65$, $p = .10$. Observations of client mental state also did not predict squalor presence, $1.24 \leq \chi^2 \leq 2.06$, $ps \geq .15$.

Table 9*Percentages or Means of Variables Included in Univariate and Multivariate Analyses for HART**Clients by Status on Living in Squalor*

Measures	<u>Not Living in Squalor</u>		<u>Living in Squalor</u>	
	n	Percentage or Mean (SD)	n	Percentage or Mean (SD)
Lack of Insight	69	52%	68	47%
Number of Pets	69	0.28 (0.80)	68	0.28 (0.61)
Cannot Sleep in Bed	69	6%	68	31%
Kitchen or Bathroom Problems	69	25%	68	60%
Disrepair	69	7%	68	16%
HOMES Mental State				
Anxious/Apprehensive	69	36%	68	46%
Angry/Defensive	69	38%	68	28%
Confused	69	12%	68	21%

Squalor Regression Analysis. A logistic regression analysis was completed to determine whether two predictor variables (kitchen or bathroom problems and being unable to sleep in the bed) uniquely predicted whether clients lived in squalor. The two predictors together significantly predicted squalor status, $\chi^2(2) = 31.57, p < .001$. As indicated by the Nagelkerke R^2 statistic, 27% of squalor variance was explained by the two predictor variables. Table 10 provides the odds ratios, which suggests that the risk of squalor for clients increased by five- to seven-fold if clients had kitchen or bathroom problems or could not sleep in their beds, respectively.

Table 10*Logistic Regression Predicting the Presence of Domestic Squalor for HART Clients, n = 137*

Predictor Variables	<i>B</i>	<i>SE</i>	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p</i>
Kitchen or Bathroom Problems	1.52	0.39	4.55	[2.11, 9.81]	<.001
Cannot Sleep in Bed	1.95	0.60	7.05	[2.16, 22.98]	.001

Disrepair Correlation and Chi Square Analyses. Data were submitted to Pearson correlations and chi square analyses to investigate relationships between disrepair and the variables of interest. Table 11 describes the percentages or means of the variables included for these analyses. Approximately half of clients with homes in good repair lacked insight, but contrary to hypotheses, this did not differ according to disrepair status, $\chi^2(1) = 1.20, p = .27$. The number of pets also did not predict whether disrepair was present, $r(135) = -.11, p = .22$. Similarly, whether clients could sleep in their bed did not predict disrepair, $\chi^2(1) = 0.00, p = .96$. Assessor observations of client mental states also did not predict disrepair status of the home, $0.06 \leq \chi^2 \leq 0.98, ps \geq .32$. Because none of the variables of interest predicted disrepair, no follow-up regression analyses were conducted.

Table 11*Percentages or Means of Variables Included in Univariate and Multivariate Analyses for HART**Clients by Disrepair Status*

Measures	<u>Not Living in Disrepair</u>		<u>Living in Disrepair</u>	
	n	Percentage or Mean (SD)	n	Percentage or Mean (SD)
Lack of Insight	121	48%	16	63%
Number of Pets	121	0.30 (0.75)	16	0.06 (0.25)
Cannot Sleep in Bed	121	18%	16	19%
HOMES Mental State				
Anxious/Apprehensive	121	41%	16	44%
Angry/Defensive	121	31%	16	44%
Confused	121	16%	16	19%

Gatekeepers

Squalor Correlation Analyses. Pearson correlational analyses were conducted to assess relationships between squalor and the variables of interest. As expected, lack of insight was significantly and positively correlated with squalor severity ratings, $r(153) = .26, p = .001$, whereas client self-reports of social connectedness to others was negatively correlated with squalor severity, $r(149) = -.26, p = .001$. Number of pets was not significantly correlated with squalor ratings, $r(153) = .03, p = .75$. On the other hand, squalor and hoarding severity ratings were significantly correlated, $r(151) = .32, p = .001$. In contrast to the other samples, unusable kitchen or bathroom was not significantly correlated with squalor, $r(164) = -.02, p = .76$.

However, the presence of general disrepair was significantly correlated with squalor, $r(162) = .27, p < .001$.

Squalor Regression Analysis. Multiple regression was conducted to determine the best linear combination of four predictor variables (lack of insight, social connectedness, assessor hoarding severity ratings, and disrepair presence) in predicting squalor severity. Bootstrapping was applied to correct for non-normal error distributions within the independent variables. This combination of variables significantly predicted squalor severity, $F(4, 129) = 10.01, p < .001$. The adjusted R^2 indicated that 24% of the variance in squalor severity was explained by the model. The beta weights, presented in Table 7, suggest that low insight, high hoarding severity ratings, and the presence of disrepair uniquely predicted increased squalor severity ratings. Furthermore, social connectedness was a marginally unique predictor of squalor severity, as clients who reported increased social connections to others were predicted to have decreased squalor scores, but this finding did not reach statistical significance.

Table 12

Simultaneous Multiple Regression Analysis Summary for Squalor Severity in Gatekeepers, n = 134.

Predictor Variables	<i>B</i>	<i>SEB</i>	<i>95% CI</i>	β	<i>p</i>
Lack of Insight	0.19	0.6	[0.09, 0.30]	0.26	.001
Social Connectedness	-0.14	0.08	[-0.29, 0.01]	-0.16	.06
Hoarding Severity	0.20	0.07	[0.05, 0.32]	0.28	.002
Disrepair	0.48	0.23	[0.01, 0.92]	0.19	.02

Disrepair Correlation and Chi Square Analyses. Data were submitted to Pearson correlations and chi square analyses to determine relationships between disrepair and the variables of interest. Table 13 provides the percentages or means of variables examined for these analyses. Lack of insight, social connectedness, and number of pets did not predict disrepair status, $r \leq .08$, $ps \geq .31$. Consistent with study hypotheses, hoarding severity was positively and significantly correlated with disrepair, $r(153) = .25$, $p = .002$. On the other hand, receiving a monthly income below the Canadian poverty line did not depend on disrepair status, $\chi^2(1) = 0.30$, $p = .58$. However, because the frequency of both disrepair and income levels above the poverty line were rare (some cell sizes were less than five), these findings should be interpreted cautiously. No follow-up regression analysis was conducted because only assessor ratings of hoarding severity were positively correlated with disrepair.

Table 13

Percentages or Means of Variables Included in Univariate and Multivariate Analyses for Gatekeepers Clients by Disrepair Status

Measures	<u>Not Living in Disrepair</u>		<u>Living in Disrepair</u>	
	n	Percent or Mean (SD)	n	Percent or Mean (SD)
Lack of Insight	141	2.72 (1.07)	16	3.00 (0.97)
Social Connectedness	138	3.50 (0.88)	17	3.29 (0.92)
Number of Pets	139	1.14 (3.17)	18	1.44 (2.85)
Hoarding Severity	139	2.05 (0.97)	16	2.88 (1.20)
Monthly Income Below Poverty Line	78	86%	12	92%

Group Differences for Bathroom Problems Within Sites

Notably, our findings indicated that having kitchen or bathroom problems was a unique predictor of squalor in both MBHP and HART. However, bathroom problems are especially interesting, as past research indicates that bathrooms are infrequently cluttered in hoarded homes. Consistent with previous research, most clients among the three community datasets in the current study had functional and accessible bathrooms (78-92% within sites). Therefore, the presence of bathroom problems is an unusual situation, which raises questions about differences between those who can easily use their bathrooms and those living with bathroom problems. To shed some light on clients living with bathroom problems, I compared clients on characteristics and living conditions that I thought could possibly be related to unusable bathrooms. These variables included client background information (e.g., age, home renter or owner status, social isolation), conditions of the home (clutter accumulation), and how clients felt about their home (lack of insight, satisfaction with living conditions).

MBHP. The variables described above were submitted to independent samples *t*-tests and chi square analyses to test for group differences between residents with or without bathroom problems. Table 14 summarizes the percentages or means of examined variables. Neither age nor social isolation predicted bathroom problems, $t(112) = 1.29, p = .20$ and, $\chi^2(1) = 1.13, p = .29$, respectively. Insight also did not predict bathroom problems, $\chi^2(1) = 0.00, p = 0.96$.

A chi square analysis showed that homeowners were more likely to have bathroom problems than were renters, $\chi^2(1) = 23.95, p < .001$. Importantly, MBHP mainly worked with tenants but made exceptions for 17 homeowners who had extremely problematic living conditions. This suggests a confound between home ownership and severity of clutter accumulation and other hoarding-related problems in the MBHP data.

Clutter accumulation was higher for the nine MBHP clients with bathroom problems ($M = 6.16, SD = 2.48$) than for the remaining clients without bathroom problems ($M = 3.98, SD = 1.43$), $t(8.47) = 2.59, p = .03$. Although only 9% of 102 clients who could easily use their bathroom had CIR average scores of 7 or higher, four of the 9 clients with bathroom problems had CIR scores that high. The range and distribution of average CIR within each group indicates that although most clients with low CIR ratings tended to have no bathroom problems, a small number of clients still managed to have functional bathrooms despite high clutter ratings.

Table 14*Percentages or Means of Variables Included in Bathroom Comparison Analyses for MBHP**Clients by Bathroom Problem Status*

Measures	<u>No Bathroom Problems</u>		<u>Bathroom Problems</u>	
	n	Percentage or Mean (SD)	n	Percentage or Mean (SD)
Client Information				
Age	105	56.16 (13.25)	9	62.00 (9.31)
Renter	104	89%	8	25%
Social Isolation	95	32%	8	50%
Conditions of the Home				
Clutter Image Rating	102	4.38 (1.48)	9	6.26 (2.49)
Client Perspectives About Living Conditions				
Lack of Insight	106	45%	9	44%

HART. Additional independent samples *t*-tests and chi square analyses were completed to identify group differences between HART clients with or without bathroom problems. Table 15 provides percentages or means for variables explored in these analyses. Neither age nor homeowner status predicted bathroom problems, $t(101) = 1.63, p = .11$ and, $\chi^2(1) = .01, p = .94$, respectively. Being able to sleep in the bed marginally predicted bathroom problems, $\chi^2(1) =$

3.16, $p = .08$. Finally, lack of insight did not predict whether clients had bathroom problems, $\chi^2(1) = 0.29, p = .59$.

Table 15

Percentages or Means of Variables Included in Bathroom Comparison Analyses for HART

Clients by Bathroom Problem Status

Measures	<u>No Bathroom Problems</u>		<u>Bathroom Problems</u>	
	n	Percentage or Mean (SD)	n	Percentage or Mean (SD)
Client Information				
Age	87	63.81 (13.00)	16	69.36 (9.50)
Renter	112	51%	18	50%
Conditions of the Home				
Cannot Sleep in Bed	119	16%	18	33%
Client Perspectives About Living Conditions				
Lack of Insight	119	49%	18	56%

Gatekeepers. Last, similar independent samples t -tests and chi-square analyses were conducted for the Gatekeepers clients. Table 16 shows the percentages or means of variables included for analyses. Consistent with MBHP and HART, age did not predict the presence of bathroom problems, $t(163) = 1.11, p = .27$. Homeowner status also did not predict whether clients had bathroom problems, $\chi^2(1) = 0.21, p = .65$. Notably, reports of feeling socially connected to others was higher for Gatekeepers clients without bathroom problems than those

with bathroom problems, $t(152) = 2.55, p = .01$. Moreover, hoarding severity was also significantly lower for clients who could easily use their bathrooms compared to those with bathroom problems present, $t(153) = 4.36, p < .001$. Independent samples t -tests also indicated that clients had lower insight when bathroom problems were present ($M = 3.15, SD = 0.99$) than when they were absent ($M = 2.63, SD = 1.05$), $t(155) = 2.59, p = .01$. Moreover, satisfaction with living conditions were rated more positively by clients living with no bathroom problems compared to those with unusable bathrooms, $t(150) = 2.34, p = .02$.

Table 16

Percentages or Means of Variables Included in Bathroom Comparison Analyses for Gatekeepers Clients by Bathroom Problem Status

Measures	<u>No Bathroom Problems</u>		<u>Bathroom Problems</u>	
	n	Percentage or Mean (SD)	n	Percentage or Mean (SD)
Client Information				
Age	129	70.72 (8.90)	36	72.58 (8.83)
Renter	129	68%	36	72%
Social Connectedness	122	3.57 (0.85)	32	3.13 (0.94)
Conditions of the Home				
Hoarding Rating Severity	124	2.00 (0.99)	31	2.87 (1.02)
Client Perspectives about Living Conditions				
Lack of Insight	123	2.63 (1.05)	34	3.15 (0.99)
Satisfaction with Living Conditions	122	2.39 (0.91)	30	2.83 (0.99)

Note. Satisfaction with Living Conditions was self-reported from 1 (very satisfied) to 5 (very dissatisfied).

Number of Pets

Although number of pets uniquely predicted disrepair at one of the three sites, number of pets was *not* predictive of squalor for all three agencies. These results are surprising, given that

substantial effort is required to maintain sanitary conditions when large numbers of pets reside in the home. Therefore, I examined the extent to which number of pets predicted the presence of urine or feces, the presence of which would undoubtedly be considered squalor by most definitions.

Correlational analyses were conducted within each site to determine if number of pets predicted the presence of urine or feces. Consistent with hypotheses, number of pets was positively and significantly correlated with the presence of urine or feces in MBHP, $r(109) = .26$, $p = .006$ and in the Gatekeepers program, $r(154) = .25$, $p < .002$. The association between number of pets and presence of urine or feces was weaker in HART, and not statistically significant, $r(135) = .15$, $p = .09$. Notably, 33% of Gatekeepers clients with moderate to severe squalor had human or animal waste present in the home, while 20% of MBHP clients and 10% of HART clients living in squalor had urine or feces also present in client dwellings. These statistics suggest that number of pets predict squalor involving urine or feces at multiple sites, but may be less predictive of other indicators of squalor (e.g., garbage overflow, mold).

Discussion

The overall aim of this project was to generate ideas about the development and course of poor living conditions in hoarding. To this end, the current study identified unique predictors of poor living conditions by examining client data from diverse community agencies that address problematic living conditions in three North American cities. Human service professionals from each agency completed home-based assessments for mainly involuntary clients that came to their attention. Site-specific analyses were conducted to test the study's hypotheses. The study findings confirmed the hypothesis that clutter accumulation and kitchen or bathroom problems uniquely predicted the presence of squalor. Number of pets was also a consistent predictor of one

specific indicator of squalor, the presence of urine or feces in the home. Moreover, high levels of clutter uniquely predicted disrepair problems. On the other hand, social isolation predicted neither squalor nor disrepair. Disrepair was also not associated with poor insight, mental state, and income. Findings were mixed regarding the extent to which poor insight predicted whether homes were squalid.

Consistent with my hypotheses, extreme clutter accumulation and difficulties using the kitchen or bathroom uniquely predicted the presence of squalor across multiple sites. Overlapping confidence intervals for these predictors in MBHP and HART indicate the effects of both variables on squalor were not significantly different across sites. The finding that clutter accumulation predicts squalor makes sense. High levels of general clutter prevent residents from accessing spaces and cleaning the home, which would strongly contribute to difficulties in maintaining household hygiene. Importantly, these findings also suggest that dysfunction in specific rooms essential for basic cleanliness (i.e., kitchen or bathroom) is uniquely associated with squalor above and beyond general clutter alone.

Bathroom or kitchen problems was a unique predictor of squalor at two of the three sites. Although a minority of MBHP and HART clients had kitchen or bathroom problems (33% and 42%, respectively), having problems with these rooms was the norm in the Gatekeepers program (94%). These percentages indicate that Gatekeeper clients had little variance in kitchen or bathroom problems, which complicates research that examines this variable as a predictor poor living conditions.

Why was kitchen or bathroom problems more frequent in the Gatekeepers Program than the other sites? One factor that sets Gatekeepers apart from the other agencies is how these clients come to the agency's attention. While MBHP is primarily concerned with people who are

at risk for homelessness because of hoarding and HART has a strong focus on addressing fire and safety hazards in severe hoarding, the Gatekeepers publicly advertised that anyone who might be at risk for self-neglect should be referred to them. Consider an example where a pharmacist notices an older man who has started coming in unusually late to refill his prescriptions, the customer seems to have recently lost a substantial amount of weight, and he has an unkempt appearance. The pharmacist would be more likely to inform the Gatekeepers program about this customer than MBHP or HART. Therefore, I would expect many Gatekeepers clients to be strikingly different from MBHP and HART clients.

Future research could examine the relationship between kitchen or bathroom problems and squalor from a different perspective. The current study examined whether kitchen or bathroom problems predicted squalor. In contrast, investigating another concept might have been helpful in predicting squalor status – whether clients were able to access a functional kitchen or bathroom. Although this data was unavailable for analyses, perhaps the Gatekeepers Program served more clients with multiple kitchen or bathrooms in their homes than the other agencies. If these clients could use other kitchens or bathrooms, then an existing problem in one of these rooms would result in few consequences for residents. Therefore, future research could approach this question from a different angle, as the current study used a problem orientation approach (i.e., does a kitchen or bathroom problem exist?), whereas researchers could alternatively investigate client strengths (e.g., does client have access to a functional kitchen or bathroom?).

Although both kitchens and bathrooms are essential for household cleanliness, severe bathroom problems are especially concerning because of potential extreme consequences for residents' personal and home hygiene. To shed light about those living with bathroom problems specifically, group differences were analyzed between individuals with or without bathroom

problems within each site. In both MBHP and the Gatekeepers Program, residents living with bathrooms that were difficult to use had higher average clutter accumulation (as measured by MBHP CIR average and Gatekeepers hoarding severity ratings, respectively) than those without bathroom problems. This finding makes sense, given that a key feature of hoarding is that stuff fills the home to the point where rooms cannot be used for their intended purposes. HART clients showed a similar trend, but this finding was not significant. This weak effect in HART could be attributed to using the dichotomous variable *cannot sleep in the bed* to measure clutter accumulation. This HOMES item provides less variation and is a less precise measure of general clutter than both CIR average and hoarding severity ratings.

Differences in clutter volume between those with or without bathroom problems provide a stepping stone for speculations about causal directions. Clutter accumulation could reasonably precede bathroom problems. Extremely high volumes of household clutter will inevitably take over the home, rendering living spaces unusable and blocking areas necessary to complete repairs. Following this logic, bathroom problems are a consequence of a severely cluttered home. Alternatively, a less convincing argument would be that bathroom problems occur first and then high clutter accumulation subsequently develops. Living with bathroom problems could negatively impact the client's day-to-day functioning and mood to the point where residents feel less motivated or become too ill to take care of the home. As a result, mild clutter problems would be exacerbated, where clients allow stuff to fill up the home with little regard for consequences to the living conditions.

The causal direction between high levels of clutter and bathroom problems have implications for interventions. If extreme clutter accumulates before bathroom problems, interventions could emphasize decreasing general clutter volume, especially spaces necessary for

accessing and repairing the bathroom to decrease the risk for squalor. In contrast, if bathroom problems come first, then interventions could focus on increasing bathroom functionality immediately. Once clients can engage in everyday tasks (e.g., bathing, washing) and perceive improvements to their quality of life because bathroom functionality has been restored, residents may feel more prepared to tackle the high volumes of clutter than they were before.

Age, social isolation, insight level, satisfaction with living conditions, and homeowner status were not significantly related to bathroom problems in at least two of the three sites. One construct was only significant in MBHP, where being a homeowner was a significant predictor of bathroom problems. However, this relationship can be explained by the type of clients MBHP served. Recall that MBHP mainly worked with tenants who received government subsidies, with some exceptions because specific homeowners had extremely problematic living conditions. Therefore, it is unsurprising that MBHP homeowners would have an inflated number of bathroom problems. Because age, social isolation, insight level, satisfaction with living conditions, and homeowner status were not consistently dependent on bathroom problems, these factors likely contribute to little variance in bathroom problems.

Returning to the topic of general squalor, number of pets initially did not uniquely predict squalor, but additional analyses suggest that number of pets predicts a specific indicator of squalor, the presence of urine or feces. Notably, 33% of Gatekeepers clients with moderate to severe squalor had urine or feces present, while 20% of MBHP clients and 10% of HART clients were recorded to have urine or feces within the dwelling. Given that assessors infrequently noted the presence of urine or feces during assessments, it is interesting that number of pets predicts this issue for both MBHP and Gatekeepers clients. This finding suggests that pet care is an important consideration during interventions. Undoubtedly, the well-being of pets is an obvious

concern when pets are severely neglected. However, these findings hint that meeting household pets' needs is not only in the best interest of the pet but is also important for the resident's living conditions. Therefore, ensuring that domestic pets are adequately cared for could be an important step in improving both pet health and resident living conditions. HART had a similar trend for number of pets predicting squalor, but the correlation did not reach statistical significance.

In contrast, social isolation was not a unique predictor of squalor presence. A weak effect was found for social connectedness and squalor at the Gatekeepers agency, whereas no friends or family present inside or outside the home at MBHP was not predictive of squalor. These results were unexpected because it makes sense that social isolation would either be a risk factor for squalor or the presence of squalor would increase the odds of social isolation. However, neither MBHP nor the Gatekeeper measured the specific construct I was originally interested in – whether other people regularly enter the home. One argument is that having the prospect of visitors in the home is a good motivator to keep living spaces clean. Furthermore, regular visitors, especially roommates, can intervene if squalor begins to develop. The extent to which this aspect of social isolation is associated with squalor is currently unknown, as this study did not have adequate data to test this association. Future research could focus on whether having other people in the home is predictive of squalor.

Poor insight was unexpectedly an inconsistent predictor of squalor across sites. Poor insight was only a unique predictor of squalor at the Gatekeepers agency. This finding is surprising, as it seems unlikely that people who are fully aware of squalid conditions in the home would not take steps to address this problem. However, residents could have good insight during the home assessment when the situation had already become severe, but failed to recognize the problem while squalor was developing. On the one hand, most people would notice if their

homes suddenly changed from being extremely sanitary one day to severely squalid the next. However, if the progression from hygienic to filthy homes was incremental, a gradual and slow decline in hygienic conditions over a long period would escape the notice of many residents. Furthermore, even if clients do have good insight, other factors might prevent them from taking action, such as a depressive episode or physical disabilities.

The relationship between insight and squalor may also be complicated. Specific factors could operate differentially on the relation between insight and squalor for distinct age groups. The pattern of study findings provides some support for this argument. Recall that MBHP served the youngest clients, while the Gatekeepers served the oldest clients. Poor insight was a significant predictor of squalor in MBHP, but this relationship was no longer significant when kitchen or bathroom problems, client mental state, and clutter accumulation were taken into account. On the other hand, poor insight was a unique predictor of squalor for Gatekeeper clients, even after controlling for social isolation and clutter volume. Another complicating factor is that fluctuating insight is also common in hoarding, yet this important aspect of insight was not considered for the current study. In cases where client insight fluctuates from no awareness to full recognition of problems, the relation between insight level during the home assessment and squalor presence would not be straightforward. Thus, relationships between age, insight fluctuations, and squalor are worth examining in future research, as I am not convinced that lack of insight should be ruled out as a predictor of squalor.

Notably, squalor was present in 35% of MBHP clients, 50% of HART clients, and 65% of Gatekeepers clients. The frequency of squalor at MBHP seems to be in line with previous estimates of overlapping hoarding and squalor cases (29-38%; Kim et al., 2001; Snowden,

1987). However, HART and Gatekeepers prevalence rates seem elevated compared to previous research.

One explanation that can help explain unexpectedly high incident rates of squalor at two of the three sites is the city in which each agency was located and the referral sources. Overall, each site provides important information about squalor and hoarding, as both agencies help clients with problematic living conditions. However, MBHP is likely to have the most accurate squalor prevalence rates within the hoarding population compared to HART and the Gatekeepers program. Several hoarding experts live and conduct research in Boston. These hoarding specialists have played a large role in improving awareness about hoarding disorder in Massachusetts and were integral in developing numerous hoarding task forces. Reflecting these efforts, out of an estimated 85 hoarding task forces in North America, about 24 of these community agencies are in Massachusetts. Because hoarding awareness is quite salient in the Boston area, referrals to MBHP have a higher chance of representing the hoarding population than HART and the Gatekeepers.

Other areas, such as Vancouver, have also taken great strides in enhancing general awareness of hoarding disorder, as can be seen from the development of HART, but these efforts are still in the early stages. The spotlight on hoarding in Vancouver is quite recent in comparison to Massachusetts, but ongoing efforts by hoarding experts in the Vancouver area will only improve public awareness of hoarding. In the meantime, some individuals who refer clients to HART have confusion about differences between hoarding and squalor. This notion was confirmed in several personal discussions between members of my lab and the HART staff agency. When HART first started taking referrals for residents living in hoarded homes in 2011, many community members reported cases of hoarding to HART, when in fact, these homes were

messy but did not contain excessive clutter. Other referral sources during these early stages of HART also commonly thought HART was a clean-up team for severe squalor and reported such cases to the team. Furthermore, no agencies within the Vancouver area specifically address squalor in the community. Thus, complainants might refer residents to HART because this agency might be the only one in the area that has at least some experience with squalor. Indeed, because of confusion among complainants and lack of specific resources for those struggling with squalor without hoarding problems in Vancouver, I would expect squalor complaints to be elevated in HART.

Furthermore, high numbers of squalor cases at Gatekeepers clients could be attributed to this agency's unique clientele. As discussed earlier, Gatekeepers clients are often referred for different reasons than MBHP and HART (e.g., clients can be referred because of problems such as poor personal hygiene, wearing inappropriate clothes). Therefore, although the Gatekeepers do address hoarding-related problems, this agency also deals with a variety of concerns that may be unrelated to hoarding, such as squalor in the absence of cluttered homes. Accordingly, high squalor prevalence rates in the Gatekeepers Program likely reflect this site's distinct mandate.

Notably, the variance explained by the squalor regression models seemed different at each site, with MBHP explaining the most variance (39%) and HART and the Gatekeepers accounting for slightly less variance (27% and 24%, respectively). These inconsistent percentages could reflect that similar variables were used to explain squalor presence in diverse populations. For example, the agencies significantly differed in age, homeownership status, eviction risk, and number of male clients. Furthermore, HART clutter accumulation, indicated by the predictor *cannot sleep in the bed*, had a remarkably wide confidence interval (2.16-22.98), which could account for the lower variance explained at this agency compared to MBHP.

Similarly, Gatekeepers disrepair presence also had a wide confidence interval, indicating that the estimations of disrepair effect on squalor were less precise than is ideal. Apparent differences in variance explained across sites could also be related to divergent measurements of squalor – varying techniques were used to identify this construct (i.e., dichotomous assessor judgments, statistically-derived dichotomous judgments, squalor severity ratings), which could help account for similar variables explaining different amounts of variance at each site.

Importantly, this is the first study to examine household disrepair in hoarding. As expected, high clutter volume uniquely predicted disrepair at two of the three sites. Large piles of stuff throughout the home make it difficult to detect problems and conduct regular repairs. In cases where a professional is required to perform repairs, fixing the problem is complicated by successfully finding a repair person who is willing to work in extremely cluttered conditions. Although analyses revealed that HART clients had a similar trend for clutter accumulation and disrepair, this finding was not significant.

Insight, social isolation, and income were consistently not predictors of disrepair. These study results suggest that clutter accumulation, rather than client characteristics, play a more important role in household disrepair. Extreme clutter accumulation introduces logistical and hazardous barriers for performing repairs, even if clients are aware that problems exist and intend to address them. Furthermore, the relationship between income levels and keeping homes in good repair may be complicated. For example, MBHP clients' housing providers benefit when all units meet building regulations (e.g., are in good repair), as this ensures the building will continue to receive government subsidies. Therefore, it is within the housing providers' best interests to fix disrepair problems, regardless of tenant income levels. Furthermore, Gatekeepers clients were older adults, many of whom presumably have substantial assets (e.g., home equity,

investments). If this is the case, then monthly income levels did not accurately reflect financial resources to make repairs, particularly in older adults.

Surprisingly, the study findings provided weak evidence for number of pets uniquely predicting disrepair. Number of pets was a unique predictor of disrepair at MBHP only. These results suggest that pets may account for little variance in disrepair. One explanation for this finding is that although unsupervised pets could damage the home, severely neglected pets (e.g., malnourished, ill) would not likely have the energy or focus to cause significant household damage.

Notably, within each site, 9-12% of homes had disrepair problems, which seems higher than estimates of disrepair in the general population. According to Statistics Canada (2011b, 2011c), approximately 7% of people from Vancouver and Hamilton self-reported living in homes that required major repairs. Taken together, these findings suggest that disrepair problems could be elevated in hoarded homes. Disrepair in the home can interfere with not only residents' safety, but also their quality of life. Additional research is necessary to understand if the estimates of disrepair found in the current study are the norm for hoarded homes or if these percentages represent over or underestimates.

Based on the strong effects found for extreme clutter and bathroom or kitchen problems uniquely predicting squalor, some ideas for how clients end up living in squalor can be considered. One argument is that squalor develops as a consequence of severe clutter, which was the most consistent unique predictor for squalor across sites. This explanation provides a compelling argument for why squalor is more common in hoarding disordered clients than in the general population. High volumes of stuff around the home undoubtedly interferes with efforts to keep the home clean. For instance, large amounts of objects could completely block off certain

areas or precariously piled stuff will deter residents from cleaning certain living spaces. Hoarding symptoms, including clutter accumulation, tend to start early in life and become gradually more severe over time (Grisham, Frost, Steketee, Kim, & Hood, 2006). Consequences of hoarding, such as squalor, could also develop alongside hoarding symptoms in a gradual manner. An incremental build-up of squalid conditions could also partially account for why relationships between poor insight and squalor are not straightforward. If squalor develops at a slow enough pace, identifying at what point the home crossed the threshold from messy to severe squalor would be difficult. This slow-moving process enhances the chance that residents will not feel a strong urge to intervene while their homes become increasingly squalid.

On the other hand, another potential pathway to squalor could involve a quick downslide into unhygienic conditions. Kitchens and bathrooms are essential rooms for basic hygiene. Consistent with this notion, problems with either of these two rooms were consistent unique predictors of squalor. If these rooms have functional issues, consequences could include the presence of human waste, spoiled food, mold, and so forth. Another factor that could occur before the rapid development of squalor is the presence of a large number of pets in the home. Number of pets increase the risk of squalor, as this factor consistently predicted the presence of urine or feces in the current study.

Figure 1 also provides other considerations for factors that may contribute to an abrupt shift from relatively clean to squalid conditions. Symptoms of a depressive episode, such as fatigue, lack of motivation, and indifference to self-care, would hamper residents' abilities to take care of the home. Cognitive impairment problems, such as the onset of delirium, could rob residents of their capacity to maintain basic living standards. Moreover, the development of

physical disabilities, especially ones that affect vision, smell, and mobility, could also increase the risk of squalor in the home.

These proposed pathways are not mutually exclusive. Both clutter accumulation and the development of squalor could gradually become worse over time. However, the appearance of potential proximal causes, such as kitchen or bathroom problems, depression, cognitive impairment, or physical disabilities, could be the tipping point to push the home from mild squalor to moderate or severe squalor. Future research could examine the extent to which the constructs discussed in this paragraph represent distal or proximal contributors to squalor.

In terms of the relationship between squalor and disrepair, study findings suggest that these are two important, but separate aspects of poor living conditions. Aside from high clutter accumulation, these two constructs did not share any other unique predictors. Furthermore, univariate analyses revealed that squalor and disrepair problems (with the exception of kitchen or bathroom problems) were not consistently associated across sites. Taken together, study results suggest that both squalor and disrepair are related to extreme volumes of clutter, but these two facets of poor living conditions are not one in the same. However, considering the obvious consequences of both squalor and disrepair in hoarding, future research is warranted to investigate the relationship between these two poor living condition facets and how they fit into hoarding.

Findings from this study have direct implications for community agencies that work with clients living in problematic conditions, such as hoarding and squalor. As of 2013, over 85 community agencies that address hoarding have cropped up within North America alone (Bratiotis, 2013). However, no evidence base currently exists for community agency professionals to draw from when deciding which areas of the home to prioritize during hoarding

interventions. Although more research needs to be completed before final conclusions are drawn, this current study provides community agency staff with preliminary guidance in choosing which areas to target first, especially if staff believe residents are at risk for poor living conditions. For example, recall the case of Alicia, who reflects a resident that could be of interest to community agencies that deal with problematic living conditions. She has poor insight, is socially isolated, is an older adult, has high levels of clutter, and is experiencing problems with her living room lights and the kitchen sink. Based on the unique predictors of poor living conditions found in the current study, agency staff would be justified in prioritizing fixing Alicia's kitchen sink and decreasing her clutter levels to reduce the odds that her living conditions will deteriorate into severe squalor and extreme disrepair.

The current study had several strengths. Importantly, the study was high in external validity – I examined mainly involuntary clients who came to the attention of diverse community agencies that deal with problematic living conditions. Study data were also collected by assessors during home-based assessments, which is a different approach from many previous studies where researchers relied on retrospective assessor reports (Kim et al., 2001; Snowdon & Halliday, 2011). Furthermore, having access to three community agencies provided the opportunity to have a built-in replication design in the current study. Thus, findings that were consistent across multiple sites, such as clutter accumulation and bathroom or kitchen problems significantly predicting squalor, provide more confidence than site-specific findings. Another strength to examining data from multiple agencies is that constructs of interest were measured in multiple ways (e.g., poor insight measured dichotomously or rated on a Likert scale). This multimethod approach allowed an examination of these constructs from different perspectives. Last, the current study examined a large number of clients, whereas previous research that

investigated relevant topics, such as the relation between insight and squalor, included small sample sizes (Gregory et al., 2011).

Although the study's external validity was strong, this came at the cost of internal validity. The community agency data were collected to facilitate and track interventions and were not collected for research purposes. That being the case, researchers did not design the measures, which is reflected in the fact that assessors completed some forms that had not been tested in terms of reliability or validity. Furthermore, some responses on the assessment forms were ambiguous. For example, on the HOMES form, assessors checked off problem areas of the home (e.g., cannot use bathtub/shower). If items were *not* checked off, this could have multiple meanings - assessors could have decided the living space was functional, assessors were unable to evaluate that portion of the home so they did not provide data on those areas, or assessors noticed a problem but simply forgot to record the data. For the current study, I assumed that unchecked items on the HOMES form were an indication of no problems in those areas, but future research could focus on improving these assessment forms to enhance reliability and validity.

A few other limitations also warrant elucidation here. One weakness to the current study was that HART squalor caseness was determined by an algorithm. Statistically-derived categorizations of squalor presence in HART may be overly inclusive. Notably, when using the ROC cut-off score that was identified in the MBHP database to estimate squalor frequency at MBHP, the occurrence of squalor at MBHP noticeably increased from 35% (assessor judgment) to 50% (cut-off score based on at least 1 of 5 squalor-related variables checked off). Future research would benefit from using assessor judgments of squalor over statistically-derived categorizations of squalor caseness, as human assessors can pick up on aspects of squalor that

could be missed by algorithms. Another limitation to this study was that assessment data were collected at one time point. Thus, this study was unable to clarify causal directions between unique predictors and the presence of poor living conditions. Last, although the base rates for disrepair were reasonable within the general population, these low incident rates complicate research to discover risk factors. Future investigations with large sample sizes should be completed before conclusions can be drawn about this facet of poor living conditions.

The study findings can provide guidance for future research, as the current study aims were to gather clues about the development of poor living conditions. Both strong predictors (i.e., clutter accumulation, kitchen or bathroom problems) and weak predictors (e.g., lack of insight) for poor living conditions were identified. Future studies could seek to clarify causal directions between unique predictors and poor living conditions found in the current study. To accomplish this goal, researchers could conduct longitudinal studies that follow community agency clients over time. Furthermore, this future research approach could provide evidence for or against my proposals of different pathways to squalor.

Additionally, future research could examine other individual differences not included in Figure 1. For example, researchers could investigate the role of disgust sensitivity in the development of squalor. Davey and colleagues have argued that disgust motivates individuals to avoid contaminated animals and objects to prevent the spread of disease (Matchett & Davey, 1991; Webb & Davey, 1992). Based on this argument, people with high disgust sensitivity would feel a sense of urgency to address even mild sanitation threats immediately. However, individuals with low disgust sensitivity are reasonably at higher risk of neglecting household hygiene than others, as these individuals have a high threshold for feeling *disgusted enough* to do

something about unsanitary conditions. To date, this is an understudied area of research that could fill an important gap in the literature.

Another avenue for research would be to examine the role of scarcity and tunneling on poor living conditions. According to Mullainathan and Shafir (2013), when individuals are under immense pressure to complete tasks in a finite amount of time, a feeling of scarcity arises where people feel they have less mental resources than they need. This feeling of scarcity is posited to capture the mind, resulting in the mind unconsciously becoming more attentive and efficient to deal with the task at hand. However, this extreme focus, or tunneling, could also result in people neglecting other, possibly more important things, as the mind is overly absorbed with accomplishing a pressing goal. These feelings of scarcity and biased attention may help explain why some individuals experience poor insight about obviously problematic homes. If clients are under high demands to complete urgent tasks, then client may be less able to notice the degradation of household conditions. To date, no research has examined these variables in the context of hoarding and poor living conditions.

Overall, the current study could help resolve previously open questions in the literature and stimulate more research about poor living conditions in hoarding. Study findings suggest that high clutter accumulation and kitchen or bathroom problems uniquely and positively predicted squalor presence. Number of pets was also a consistent unique predictor of one indicator of squalor, the presence of urine or feces. Furthermore, high clutter accumulation was the only replicated positive predictor of disrepair presence. Importantly, this study has impressive external validity – not only did I have access to client data from community agencies about client personal characteristics and household conditions, but the sample was also comprised of mainly involuntary clients from three North American cities. Therefore, findings from this study are

highly generalizable to clients seen by community agencies that are involved with hoarding and poor living conditions.

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