SOCIAL SUPPORT IN HOARDING

by

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Abstract

Many people with hoarding problems have never been married and live by themselves. Further, treatment-seekers tend to be elderly, which puts them at special risk for social isolation. Research has established strong links between social support and many aspects of psychological health, but the role of social support in hoarding has not yet been explored. Does excessive clutter drive away people who care? Does living alone provide freedom to accumulate clutter? How social support is provided and received is also relevant. Although family members or healthcare workers may intend to minimize health and safety risks associated with hoarding behaviour, actions they intend to be supportive may be delivered insensitively or inappropriately. Previous research has found that hoarding is a source of family burden and distress. As a result, hoarding may be related to interpersonal conflict. This study investigated (1) social integration, the degree to which someone is involved in a broad range of relationships, (2) perceived support, the amount of support perceived to be available if need arises, (3) received support, the amount of support perceived to have been obtained, and (4) social conflict, which broadly includes a range of negative social interactions. Seventy-eight participants with a range of hoarding symptoms were surveyed online. The relations among hoarding symptoms and four aspects of social support were examined. The effect of depression was considered, as it is highly comorbid with hoarding and may account for some aspects of poor social support. Hoarding was related to perceived support and social conflict, but this relationship was explained by depression. In contrast, hoarding was not related to social integration or received support. This study provides a basis for further research on social interactions in hoarding, and demonstrates the necessity in building sensitivity and awareness beyond media portrayals of hoarding, such that supportive behaviours are delivered in a thoughtful manner that minimizes conflict. Additionally, this study

ii

has implications for encouraging social integration and addressing issues of social support and conflict within hoarding interventions.

Preface

This thesis was based on work conducted in Dr. Sheila Woody's laboratory at the UBC Department of Psychology. I was responsible for the study design, preparation, performance, data analysis, and writing. The study was approved by the UBC Behavioural Research Ethics board under the project title "Sense of Community and the Home Environment" (H15-00242).

Abstract	ii
Preface	iv
Table of Contents	v
List of Tables	viii
List of Figures	ix
Acknowledgements	x
Introduction	1
Social Integration	4
Support Availability (Perceived Support and Received Support)	7
Social Conflict	
Stigma	13
Current Study	15
Method	16
Research Design	16
Participants	16
Procedure	19
Measures	19
Demographics questionnaire	19
Saving Inventory-Revised (SI-R).	19
Clutter Image Rating (CIR).	
Depression Anxiety Stress Scales-21 (DASS-21).	
Social Network Index (SNI).	
	v

Table of Contents

Interpersonal Support Evaluation List (ISEL).	22
Inventory of Socially Supportive Behaviours (ISSB)	22
Test of Negative Social Exchange (TENSE).	23
Results	24
Data Analytic Plan	24
Hypothesis 1: Greater hoarding severity will predict less social support even a	fter
accounting for depression	24
Secondary hypothesis 1: Depression will interact with hoarding severity to	
predict social support	24
Hypothesis 2: Specific hoarding symptoms will uniquely predict social suppor	t 25
Secondary hypothesis 2: Depression will interact with specific hoarding	
symptoms to predict social support.	25
Power Analysis	26
Missing Data	26
Using the 23-item SI-R with multiple imputation.	27
Using the 16-item SI-R	28
Description of Scores	29
Extreme Values and Assumption Checks	34
Hoarding (Total) Symptoms as a Predictor of Social Support (Hypothesis 1)	34
Social integration.	34
Perceived support	34
Received support	35
Social conflict.	35
	vi

Specific Hoarding Symptoms as Predictors of Social Support (Hypothesis 2)
Perceived support
Social conflict
Confidence in Findings
Discussion
Hoarding (Total) Symptoms as a Predictor of Social Support
Social integration
Perceived support
Received support
Social conflict
Specific Hoarding Symptoms as Predictors of Social Support
Role of Depression in Predicting Social Support
Limitations
Sample characteristics
Assessment of hoarding
Self-report
Online surveys
Missing data70
Implications and Conclusions72
References

List of Tables

Table 1: Demographics as a Percentage of the Sample 18
Table 2: Saving Inventory-Revised (SI-R) Means and Standard Deviations Compared to Clinical
and Non-clinical Samples in (Frost et al., 2004)
Table 3: Summary Statistics 32
Table 4: Correlations Matrix
Table 5: Hierarchical Multiple Regression Analyses Predicting Social Integration, Perceived
Support, Received Support, and Social Conflict from SI-R Hoarding (Total) and Depressive
Symptoms
Table 6: Hierarchical Multiple Regression Analyses Predicting Perceived Support and Social
Conflict from Various Hoarding Symptoms and Depressive Symptoms
Table 7: Hierarchical Multiple Regression Analyses Predicting Perceived Support and Social
Conflict from Various Hoarding Symptoms and Depressive Symptoms for Participants who
Completed the Survey in over 20 Minutes

List of Figures

Figure 1: Interaction of DASS Depression and SI-R Clutter Symptoms on Perceived Support 42
Figure 2: Interaction of DASS Depression and SI-R Difficulty Discarding Symptoms on
Perceived Support
Figure 3: Interaction of DASS Depression and SI-R Acquisition Symptoms on Social Conflict 48

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Introduction

Hoarding is a psychological disorder characterized by extreme difficulty in discarding items that have limited objective value, intense urge to acquire items, and excessive accumulation of clutter around the home. Previously considered a subtype of obsessive-compulsive disorder (OCD), hoarding is now categorized as a separate disorder in the DSM-5 (American Psychiatric Association, 2013). When clutter is severe, navigation within the home can become nearly impossible and the intended use of living spaces is compromised and impedes the hoarder's quality of life. For example, clutter can impair daily functioning by obstructing an individual's ability to shower, cook, and even sleep in their bed. Severe accumulation of clutter can also increase health and safety risks, pose fire hazards, and cause personal and environmental sanitation problems for both the resident and those living with or near them. For these reasons, hoarding has been associated with greater occupational impairment and more family conflict than other anxiety disorders (Frost, Ruby, & Shuer, 2012a). Additionally, the high comorbidity with disorders of depression and anxiety markedly complicates hoarding problems (Frost, Steketee, & Tolin, 2011).

One factor that could reflect the impairments associated with hoarding disorder is social support. In general, social support is strongly associated with mental and physical health (House, Landis, & Umberson, 1988) through an individual's emotional, cognitive, and behavioural responses to their environment (S. Cohen, 1988). For mental health, social support may maintain healthy regulation of these responses through communication of expectations and appropriate social norms, and through provision of emotional or instrumental coping assistance (Thoits, 1986). For physical health, social support may influence risks of, progression of, and recovery from physical illnesses. Specifically, studies have suggested that social relationships influence

health-promoting behaviours in areas such as smoking, alcohol intake, diet, exercise, sleep, and adherence to medical treatment and regimens. The inability to adaptively regulate responses to the environment can contribute to psychological problems such as cognitive decline, as well as adversely affect neuroendocrine, immune, and cardiovascular systems (Cornwell & Linda, 2009; DiMatteo, 2004; Uchino, 2006). Unfortunately, social support research is lacking for people with hoarding problems—a vulnerable group that could clearly benefit from having social support.

Hoarding researchers have minimally investigated social support, and only several factors are known about hoarding and social interactions. People who hoard tend to be unmarried, live alone (H.-J. Kim, Steketee, & Frost, 2001; Samuels, Bienvenu, Riddle, & Cullen, 2002), have greater social anxiety and schizotypal features (Frost, Steketee, Williams, & Warren, 2000; Samuels et al., 2002; Steketee, Frost, Wincze, Greene, & Douglass, 2000). Because treatment seekers or those that come to the attention of community agencies are often elderly, the special risk for social isolation in elderly hoarding clients is particularly concerning (H.-J. Kim et al., 2001). A few studies have indirectly touched upon the relationship between hoarding and social support through examining family burden and conflict (Tolin, Frost, Steketee, & Fitch, 2008b) and interpersonal distress (Grisham, Steketee, & Frost, 2008). However, the rich and multidimensional nature of social support calls for further investigation in the context of hoarding. Clutter tangibly affects anyone who is exposed to the person's living space, and affects people in close proximity not only emotionally, but also physically-an inconvenience around the house if clutter is mild, a health and safety risk if clutter is severe. Thus, hoarding problems may contribute additional complexity to social support issues, above and beyond other psychological problems.

Two studies have specifically examined aspects of interpersonal relationships in hoarding, but important questions remain unanswered. Grisham, Steketee, and Frost (2008) found that community controls had significantly less interpersonal distress than individuals in the hoarding and non-hoarding anxious or depressed groups, which did not differ from each other. People with hoarding tend to have distinct beliefs about emotional attachment, memory, control, and responsibility regarding their possessions (Steketee, Frost, & Kyrios, 2003). Upon further examination, these hoarding beliefs were marginally related to interpersonal problems above and beyond depression and anxiety (Grisham et al., 2008). Medard (2013) studied social support more specifically and found that attachment and social support predicted 13% of total hoarding symptoms. Furthermore, attachment and social support was more related to clutter symptoms than difficulty discarding and acquisition symptoms.

Grisham et al. (2008) examined how depression and anxiety affects hoarding symptoms; however, the study measured interpersonal distress in terms of predispositions that people bring to situations, which is only one aspect of social support. Grisham et al. (2008) also investigated the relationship between hoarding beliefs and interpersonal distress accounting for depression and anxiety, but did not examine the relationship involving hoarding *symptoms*. Understanding beliefs about hoarding is fundamental, but the manifestations of these beliefs into hoarding symptoms are equally, if not more important to explore due to the potential impact of the symptoms on the individual and close others. In contrast, Medard and Kellett (2013) examined various aspects of social support using subscales of the Social Provisions Scale (although each subscale may not measure each construct in depth); however, the crucial role of comorbid problems, namely depression, was not mentioned (Medard & Kellett, 2013). Given that many psychological problems are associated with poor social support, clarifying that the findings about

hoarding are unique is essential and will be addressed in this current study. Additionally, targeting specific and relevant social factors is important due to the various conceptualizations of support in the literature.

The concept of social support broadly refers to characteristics of a social environment or the people who surround individuals in their network and is related to the process through which relationships might promote health and well-being (S. Cohen, Gottlieb, & Underwood, 2000). Many aspects and constructs of social support have been examined. For example, structural network size and density, social integration, social engagement, perceived availability of support, and subjective accounts of received support are all distinct constructs in the social support literature. At best, these constructs are moderately correlated and relate to each other and to health outcomes through different mechanisms (e.g., Barrera, 1986; S. Cohen, 1988; S. Cohen, Mermelstein, Kamarck, & Hoberman, 1985; Heller & Lakey, 1985). As a preliminary investigation of social factors in hoarding, the following constructs will be examined: (1) social integration, (2) perceived support, (3) received support, (4) and social conflict.

Social Integration

Social integration is the degree to which a person is involved in a broad range of social relationships. Measures of social integration often consider factors such as marital status, number of friends, frequency of social interactions, and number of personal roles (e.g., student, sister, daughter, employer). People who are more highly integrated have lower mortality rates (Berkman, 1995; Berkman & Syme, 1979), are more likely to recover from myocardial infarction (Berkman, 1995; Seeman, 1996), are less susceptible to infectious illnesses (S. Cohen, Doyle, Skoner, Rabin, & Gwaltney, 2014), and are less likely to report depression (S. Cohen & Wills, 1985).

It has been long established that a high degree of social integration regulates behaviour and protects well-being. Consistent with this theory, individuals who were not socially integrated had the highest rates of suicide (Durkheim, 1987, 1951). Some researchers have suggested that possessing multiple social roles have been thought to create strain due to conflicting obligations (Goode, 1960). Caregivers who have more social roles experience greater stress and negative affect, whereas caregivers with fewer social roles have more meaningful caregiving experiences (Y. Kim, Baker, Spillers, & Wellisch, 2006). In contrast, most other researchers believe that having multiple roles enhances psychological well-being, based on enhanced self-esteem, approval, and privileges, all of which outweigh the costs of having multiple roles (Faris, 1934; Marks, 1977; Sieber, 1974). A different study found that caregivers who have more social roles reported better health than those with fewer roles, and no evidence of role strain was found (Rozario, Morrow-Howell, & Hinterlong, 2014). Additionally, Thoits (1983) suggested that having different roles provides individuals with a sense of purpose as well as behavioural expectations and predictability within these social environments. Through various mechanisms such as improving self-identify, self-esteem, sense of control, and positive affect (S. Cohen, 1988), having many social relationships and roles may guide and facilitate health-promoting behaviours and prevent risky behaviours (Lewis & Rook, 1999; Umberson, 1987).

Thoits's (1983) suggestions regarding behavioural expectations may be applied to hoarding. Social integration may guide hoarding behaviours both explicitly and implicitly; the presence of people may act as a buffer to the development, maintenance, or exacerbation of hoarding in several ways, as well as improving treatment response. Hoarding symptoms may be constrained by partners, family members, or others who reside in the same home. These people may communicate and impose limits on the amount of space that the individual can take up

inside a home. For example, they may restrict the number or types of items acquired, facilitate effective organizing and discarding, and occasionally enforce the removal of clutter. When an individual with a propensity to hoard become financially and physically independent, such as by leaving parents' home or through the loss of a spouse, the individual may accumulate more possessions due to factors such as increased storage space or liberation from imposed limits. Indeed, Tolin, Meunier, Frost, and Steketee (2010) found that for individuals with hoarding symptoms, the removal of these external constraints led to increased severity in hoarding symptoms.

Social norms and guidelines may also implicitly constrain hoarding tendencies. For example, an individual living with housemates may be more likely to recognize or internalize that belongings should remain in designated personal spaces, such as one's bedroom or hobby area, and that only shared items are typically stored in other rooms of the home. Low social integration in people who hoard may also decrease the likelihood of having visitors and using the home as a social space. Anecdotally, even hoarders who report having adequate social support do not invite others to their home due to shame and embarrassment about the condition of their home. Without visitors, people who hoard are unlikely to experience the social pressure associated with the need to tidy a house for guests. Thus, low social integration may allow clutter to accumulate more easily, while the clutter, in turn, may pose a barrier to social interaction with visitors within a hoarder's home.

Social integration may be the most feasible type of social support to incorporate into treatments for hoarding. For example, therapists may encourage clients to participate in more social interactions in both individual and group treatment settings. Group treatments in particular provide clients with the benefit of having a sense of belonging. Clients with good insight may

also seek out group treatment and self-help Internet groups (Muroff, Steketee, Himle, & Frost, 2010) because they recognize the importance of having others' support and therefore value encouragement and informational guidance from others. Indeed, intervention researchers have also shown that encouraging greater frequency of social contact is beneficial for various health conditions (e.g., Krauss, Upshur, Shonkoff, & Hauser-cram, 1993). Overall, social integration may operate in various ways to affect the development and treatment individuals with hoarding problems.

Support Availability (Perceived Support and Received Support)

Support availability is only modestly associated with social integration. Most researchers agree that social integration and support availability are distinct constructs that operate through different mechanisms, and thus the relationship between them is of interest in the social support literature (S. Cohen, 1988; S. Cohen & Wills, 1985; House et al., 1988). Social integration is an example of structural support, which refers to social interconnections. Examining concepts of functional support complements concepts of structural support. In hoarding, functional support can include emotional support such as listening, reassuring, and valuing the individual, and providing indications of acceptance. Instrumental support can involve providing tangible resources such as helping to organize and sort items or offering a ride to discard items. Informational support can involve providing information about resources and providing guidance about possible, or alternative, courses of action in any given situation, for example, when making difficult decisions about items or obtaining appropriate third-party assistance (e.g., community agencies, treatment groups). Companionship support can involve availability of companions for social and leisure activities or de-cluttering work. Feedback, validation, or social comparison can involve providing information about the appropriateness or normativeness of behaviours, such as

an appropriate quantity of belongings or housekeeping practices (S. Cohen & Wills, 1985; Helgeson, 2003).

Social support availability can be divided into perceived support and received support. Perceived support refers to the amount of support people believe they will receive should they need it and can be better considered as perceived support *availability* rather than a subjective view of received support as the term might imply. Received support refers to the amount of supportive behaviours people have recently obtained, thus measuring available support based on previous experience. Perceived support is future-oriented and anticipatory, whereas received support is past-oriented and obtained. A meta-analytic study that found a correlation of r = .35between measures of perceived support and the most widely used and well-validated measure of received support, the Inventory of Socially Supportive Behaviours (Haber, Cohen, Lucas, & Baltes, 2007). The modest correlation demonstrates that these two concepts are distinct, and thus received support may not necessarily influence perceived support availability.

One explanation for these weak correlations is that perceived support is subject to individual judgment and memory processes (Lakey & Drew, 1997) and depends on the context, including the quality of the relationship or particular circumstances (Lakey, McCabe, Fisicaro, & Drew, 1996). For example, beliefs about self-worth and the availability and responsiveness of others contribute to the amount of support perceived to be available. Indeed, individuals who have a positive view about themselves and others demonstrate greater perceived support availability (Blain, Thompson, & Whiffen, 1993; Sarason et al., 1991). However, individuals with hoarding symptoms may have distorted cognitions about themselves that are tied to objects (e.g., "these possessions are my identity" or "without my possessions, I am nothing"), or negative cognitions about others' inability to empathize with their strong emotional attachments

to objects and their unwillingness to assist in hoarding-related tasks (i.e., sorting, organizing, discarding, and resisting acquisition of items), which decreases perceived support availability. Distinctive personalities and circumstances around each hoarding situation may be subject to differing views and judgments, which may alter perceived support availability.

On the other hand, received support assesses the actual supportive behaviours that social network members have already provided to a recipient, which are intended to be helpful (Dunkel-Schetter, Blasband, Feinstein, & Herbert, 1992). These measures often require respondents to recall specific and identifiable examples of past recent behaviour (e.g., asking respondents whether someone has lent them money in the past 30 days) rather than a general impression, and are intended to closely reflect actual support received (Barrera, 1986). Unlike perceived support, inter-observer agreement (i.e., between the support provider and recipient) is very high for received support (r = .75; J. L. Cohen, Lakey, Tiell, & Neeley, 2005).

Given that depression is highly co-morbid with hoarding (Frost et al., 2000), studies of support availability and depression warrant additional emphasis. Perceived support was negatively associated with experimentally induced depressed mood (L. H. Cohen, Towbes, & Flocco, 1988a) and reported depression (e.g., Dahlem, Zimet, & Walker, 1991). Perceived support also mediated the relationship between functional disability and depressive symptoms (Yang, 2006). Additionally, psychiatric patients, especially depressed patients, have less perceived support than physically ill patients and undergraduate students (Eker & Arkar, 1995; Lyons, Perrotta, & Hancher-Kvam, 1988). Although research has established the relationship between support availability and depression, the direction of the relationship is still unclear.

Research on perceived support has consistently demonstrated associations with reduced stress and improved physical and mental health, but research on received support has been

inconsistent. Studies with positive outcomes have demonstrated that greater received support was associated with more stable mental health after natural disasters (Norris & Kaniasty, 1996), lower heart rate and blood pressure (Lepore, 1995; Thorsteinsson & James, 1999), and easier labor progress during pregnancy (Collins, Dunkel-Schetter, Lobel, & Scrimshaw, 1993). In the context of hoarding, received support could include emotional support such as providing empathy and encouragement, and physical support such as respectfully assisting with sorting, organizing, and discarding of items. However, behaviours that are intended to be supportive may feel coercive and betraying instead. For example, significant others may clean up the home while the person who hoards is out of town, or professional workers may forcefully dispose of items by the truckload. In both cases, support providers intend to create a safer home environment but their actions may feel violating. These experiences have been documented more broadly in the literature: received support has occasionally been associated with positive outcomes, but more often with mixed or negative outcomes, including more negative affect (Peeters & Le Blanc, 2001; Yang & Carayon, 1995) depression (Frese, 1999; Krause, 1997), and other mental health problems (Iwata & Suzuki, 1997).

In addition to these inconclusive findings for received support, studies have demonstrated differing outcomes for perceived support and received support. For example, perceived support has been associated with reduced social strain in men and women, but received support was associated with increased strain for men but not for women (Lindorff, 2000). Differential outcomes of depression based on support type are especially curious. Perceived support has strong negative correlations with depression, whereas received support has demonstrated both positive (Reinhardt, Boerner, & Horowitz, 2006) and negative (e.g., Krause & Markides, 1990) correlations. Another study demonstrated that for recently diagnosed cancer patients, perceived

support has direct beneficial effects on depression and promotes support-seeking, while received support has indirect beneficial effects through appraisal and coping behaviour (Komproe, Rijken, Ros, Winnubst, & Hart, 1997).

Conflicting findings may be partially explained by contextual details of received support: outcomes can be dependent on the nature of the stressor, the motivation and thoughtfulness of the provider, and responsiveness of the recipient (Helgeson, Cohen, Schulz, & Yasko, 2000; Nurullah, 2012; Uchino, 2009). Received support may be ineffective under stressful situations (e.g., Gottlieb, 2000), lower self-esteem and sense of independence (e.g., Bolger, Zuckerman, & Kessler, 2000; Matire, Stephens, Druley, & Wojno, 2002), or create relational friction that may undercut the helpfulness of supportive behaviours (e.g., Holt-Lunstad, Uchino, Smith, & Hicks, 2007; Uno, Uchino, & Smith, 2002). Therefore, well-intended support is not always wellreceived.

Thus far in this review, support has generally been considered positive; however, negative aspects also exist and may be damaging. People with high perceived support availability may feel that others are ready and willing to support them, but people with high received support may feel indebted to the provider, guilty for receiving support, and threatened in terms of selfefficacy and self-esteem (Bolger & Amarel, 2007; Gleason, Iida, Bolger, & Shrout, 2003). Hoarding may be a prototypical example of received support leading to greater stress and conflict. Support providers (e.g., health workers, clinicians, partners, family members) intend to minimize the health and safety risks associated with hoarding and improve quality of life for the individual. However, these actions may be perceived as violating, intrusive, and disrespectful, creating friction and conflict that was previously absent.

Social Conflict

Studies have generally found positive and negative social interactions to be independent constructs (e.g., Finch, Okun, Barrera, Zautra, & Reich, 1989; Fiore, Becker, & Coppel, 1983; Pagel, Erdly, & Becker, 1987; Rook, 1984; Ruehlman & Wolchik, 1988; Sandler & Barrera, 1984). Both types of interactions are related to well-being, but negative interactions appear to have stronger effects. For example, compared to positive interactions, negative interactions are more predictive of distress (Finch et al., 1989), depressive symptoms (Finch, Okun, Pool, & Ruehlman, 1999; Okun & Keith, 1998; Pagel et al., 1987; Schuster, Kessler, & Aseltine, 1990), physical symptoms (Edwards, Hershberger, Russell, & Markert, 2001), and level of functioning (e.g., Henderson, Byrne, Duncan-Jones, Scott, & Adcock, 1980). However, the weak correlations between positive and negative social interactions may be contingent on the type of social support measured, such as perceived support availability or frequency of support (see review by Finch et al., 1999), and the source of negative interactions (e.g., spouse, friends, family members, etc.; Okun & Keith, 1998).

Negative interactions are relatively broad, encompassing interactions that are perceived as unpleasant, resistive, hostile, conflictual, or hurtful. Although negative interactions are not necessarily direct measures of social support, people involved in the exchanges are likely to feel unsupported. Even supportive feedback may be received as either beneficial or critical. These interactions can result in psychological and physical problems, lower self-esteem, self-efficacy, and quality of life, as well as interfere with goal-directed activity, problem solving, and use of resources (e.g., Rook, 1984; Ruehlman & Karoly, 1991; Shinn, Lehmann, & Wong, 1984). Additionally, negative interactions strain coping skills, elicit feelings of demoralization, and reduce perceived support and satisfaction (Ruehlman & Karoly, 1991).

Often due to unfulfilled expectations, feelings of frustration, irritation, alienation, and hurt can lead to conflict (MaloneBeach & Zarit, 1995). Conflict has been negatively associated with well-being and quality of life (Abbey, Abramis, & Caplan, 1985; Ruehlman & Wolchik, 1988), and positively associated with negative affect (Bolger, DeLongis, Kessler, & Schilling, 1989) and depression (Fiore et al., 1983; MaloneBeach & Zarit, 1995; Pagel et al., 1987; Westdahl et al., 2007). In hoarding, the potential involvement of partners, family members, friends, housing providers, and even community agencies may contribute to conflict. Individuals who have lived in a hoarded home as children report lower happiness, more difficulty making friends, less social contact in the home, and more tension within the family (Tolin, Frost, Steketee, & Fitch, 2008b). Strikingly, family members of the hoarding clients have higher patient rejection attitudes (i.e., family frustration and hostile attitudes toward the individual) than family members of OCD and schizophrenia patients. Moreover, these negative attitudes have been associated with more severe hoarding behaviours, less insight from the hoarding family member, and severe clutter in the home during early childhood (Tolin, Frost, Steketee, & Fitch, 2008b). Clinical observations suggest that family members and/or partners can be critical and unhelpful in treatment progress—expecting easy solutions, immediate progress, and no relapse. In reality, hoarding is a complicated concern without quick fixes.

Stigma. Stigma towards people with hoarding may be similar to stigma towards people with physical illnesses or disability, and may lead to hurtful and unsupportive behaviours (Chesler & Barbarin, 1984; Goffman, 1963; Varni & Setoguchi, 1991). Because stigma and discrimination generally reflect a lack of knowledge or contact with the stigmatized group (French, 1984), social network members of the stigmatized individual may feel anxious about interactions, unknowingly communicate inappropriately (e.g., Lehman, Ellard, & Wortman,

1986), or become overinvolved, resulting in resentment and conflict (Coyne, Wortman, & Lehman, 1988). Family members are also affected and may feel that their relationship with the person with mental illness is shameful and should be concealed (e.g., Phelan, Bromet, & Link, 1998; Shibre et al., 2001). Caregivers of stigmatized individuals have reported poor communication from others including insensitive comments, persistent questions concerning inability, unsolicited or inappropriate advice, and pitying remarks (Patterson, Garwick, Bennett, & Blum, 1997). Stigma may be especially evident in hoarding because extreme clutter is displayed in a home. Family members of people who hoard reported embarrassment about the individual and the condition of their home (Tolin, Frost, Steketee, & Fitch, 2008b). Given enough insight, people who hoard may experience shame about their situation and minimize social interaction to avoid discovery and judgment.

Poor social support may allow exacerbation of hoarding symptoms, and in return, hoarding symptoms may also foster social isolation. The tradeoff between adequate living space and items of limited value is an easy decision for someone who does not hoard, but family members, neighbours, community agencies, or support workers often do not understand the extreme attachment to possessions and the distress associated with discarding. They may trivialize the difficulties of hoarding and express this in various ways, such as verbally accusing the individual of irresponsibility or inconsideration, or discarding the individual's possessions without permission. Conflict is equally relevant to hoarding because well-intended support providers prioritize health and safety, whereas the individual may prioritize their emotional attachment to objects.

Current Study

Together, these different aspects of social support—social integration, perceived support, received support, and social conflict—all add to the complex phenomenon of hoarding. Given the robust associations between types of social support and mental and health outcomes, understanding whether and how these concepts affect hoarding will ultimately inform social network members (i.e., family and friends, health care workers, clinicians) about how to best care for the individual to improve outcomes. Our limited knowledge of the state of social support in hoarding propelled this study to ask exploratory but essential questions, with the expectation that preliminary findings will provide a stepping stone to future research concerning social support in hoarding.

This current study investigated two main hypotheses: (1) greater hoarding severity will predict less social support even after accounting for depression, and (2) specific hoarding symptoms uniquely predict more social conflict even after accounting for depression. Four types of social support will be examined: social integration, perceived support, received support, and social conflict.

Method

Research Design

The current study used a cross-sectional design to address the research questions, which is appropriate to examine how hoarding severity may be related to social support at any given time.

Participants

Eighty-four participants were recruited from the laboratory's Hoarding Research Registry and the community. The registry consists of individuals who have previously participated or are interested in participating in hoarding research, including those who self-identify as having problems with hoarding. An e-mail invitation was sent to members of the registry. These members were permitted to forward the advertisement to others who may be interested in participating. Two weeks later, a follow-up e-mail was sent to individuals who have not yet responded to the invitation. Advertisements were then posted in various areas in the community, such as coffee shops, community centers, bus stops, street poles, craigslist, and kijiji. All participants were required to be fluent in English, above the age of 19, and reside in Canada.

Six participants were excluded on the basis of completing the survey in less than ten minutes, as it was deemed an inadequate amount of time to actually read and respond to all items. Data were analyzed based on a final sample of 78 participants. The mean age of participants was 42.95 (SD = 14.15). Most of the participants were female (73.1%, n = 57). All other sample characteristics are presented in Table 1. The majority of this sample (64.2%, n =50) lived in a small 1 or 2-bedroom apartment (3-6 rooms). A similar proportion of participants lived with family (32.1%, n = 25) or lived alone (30.8%, n = 24). Using the categorical

interpretation of the Social Network Index, fewest participants were on the extreme ends of having the least or most connections.

Table 1

Characteristic	% (N)
Recruitment Source	
Registry	59.0 (46)
Referral	5.1 (4)
Poster	7.7 (6)
Craigslist/Kijiji	28.2 (22)
Education	
Elementary or middle school	1.3 (1)
High school or equivalent	23.1 (18)
College diploma	26.9 (21)
Bachelor degree	29.5 (23)
Graduate or professional degree	19.2 (15)
Income	
Less than \$19,999	43.6 (34)
\$20.000 to \$49.999	35.9 (28)
\$50.000 to \$99.999	15.4 (12)
\$100,000+	5.1 (4)
Rooms in Home (not including bathrooms))
1-2	23.1 (18)
3-4	38.5 (30)
5-6	25.7 (20)
7-8	8.9 (7)
9-10	3.9 (3)
Living Situation	
Alone	30.8 (24)
With a partner	20.5 (16)
With family	32.1 (25)
With housemate(s)	15.4 (12)
Other (Housesitting)	1.3 (1)
Social Connectedness	
0 (fewest connections)	11.5 (9)
1	21.8 (17)
2	35.9 (28)
3	21.8 (17)
$\frac{1}{4}$ (most connections)	90(7)

Demographics as a Percentage of the Sample

4 (most connections)9.0(7)Note: N = 78. Social Connectedness was measured by the categorical interpretation of the Social
Network Index.

Procedure

As a preliminary exploration of social support and social conflict in hoarding, the study measures were administered to participants online using LimeSurvey. Eligible participants were sent an e-mail invitation with the link to the survey, which included an electronic consent form. Participants were administered the measures in the following order: demographics questionnaire, the Social Network Index, the Interpersonal Support Evaluation List, the Inventory of Socially Supportive Behaviours, the Test of Negative Social Exchange, the Depression Anxiety Stress Scale, the Saving Inventory-Revised, and the Clutter Image Rating. All participants were given the option to be compensated with an \$8 Amazon gift code or donating the same amount to the Canadian Mental Health Association (BC Division).

Measures

Demographics questionnaire. The demographics questionnaire created for this study assessed age, gender, education, income, number of rooms (excluding bathrooms), and living situation.

Saving Inventory-Revised (SI-R). The SI-R (Frost, Steketee, & Grisham, 2004) is a 23item measure with three subscales of difficulty discarding, clutter, and excessive acquisition, which can be summed to create a total score. Participants are asked to rate each item on a 4-point scale (0 = not at all to 4 = almost all). The SI-R subscales have good test-retest reliabilities ranging from .78 to .90 over two to four weeks, and high internal consistencies ranging from .87 to .92. The SI-R demonstrated convergent validity with other measures of hoarding, and discriminant validity with measures of OCD and negative and positive affect. Mean scores of the SI-R clearly distinguished hoarding participants (M = 53, SD = 14) from healthy controls (M = 24, SD = 12). People with hoarding problems typically obtain a score of greater than 41(Frost, Steketee, & Tolin, 2012b).

Clutter Image Rating (CIR). The CIR (Frost, Steketee, Tolin, & Renaud, 2007) is a pictorial assessment that measures clutter severity and can be completed as a self-report or an observer-rated measure. The three rooms (living room, kitchen, and bedroom) are presented on separate pages with nine photographs depicting increasing amounts of clutter labeled from 1 (*no clutter*) to 9 (*severe clutter*). Respondents are asked to select the picture that best corresponds with the amount of clutter in the client's home. The CIR demonstrated good convergent validity with the SI-R Clutter subscale (r = .57 to .63); discriminant validity through lower correlations with other SI-R subscales not measuring clutter (r = .25 to .33), and internal consistency for the composite score ($\alpha = .84$). The CIR also demonstrated good inter-observer reliability between participant- and experimenter-rated composite CIR scores (r = .78), which suggests a close match between participants' reports of clutter in the clinic and actual clutter in their home(Frost et al., 2007).

Depression Anxiety Stress Scales-21 (DASS-21). The DASS-21 (P. F. Lovibond & Lovibond, 1995) is a 21-item measure of depression, anxiety, and stress. Studies have repeatedly found a three-factor structure for these constructs (Antony, Bieling, Cox, & Swinson, 1998; Clara, Cox, & Enns, 2001). Participants are asked to rate how much a statement applied to them over the past week (e.g., "I was aware of dryness of my mouth", "I found it difficult to relax", "I felt I wasn't worth much as a person") on a 4-point scale (0 = *did not apply to me at all* to 3 = *applied to me very much or most of the time*). Scores are doubled to compare with recommended cut-offs in the original DASS to indicate normal (0-9), mild (10-12), moderate (13-20), severe (21-27), or extremely severe (28-42) levels of each construct (Haggman, Maher, & Refshauge,

2004). The DASS demonstrated excellent test-retest reliabilities for all three scales (r = .71 to .81) over two weeks and was acceptable for both clinical and non-clinical samples (Antony et al., 1998; Brown, Chorpita, Korotitsch, & Barlow, 1997; Crawford & Henry, 2003; P. F. Lovibond & Lovibond, 1995). Cronbach's alphas were very good, .88 for depression, .82 for anxiety, .90 for stress, and .93 for the total score (Henry & Crawford, 2005), and internal consistencies were excellent for various populations, .84-.96 (Brown et al., 1997; P. F. Lovibond & Lovibond, 1995; Taylor, Lovibond, Nicholas, Cayley, & Wilson, 2005). Good convergent validity was demonstrated by high correlations between DASS Depression and the Beck Depression Inventory (r = .74) and between DASS anxiety and Beck Anxiety Inventory (r = .81); good discriminant validity was demonstrated by lower correlations between DASS Depression and the Beck Depression and the Beck Anxiety Inventory (r = .54; P. F. Lovibond & Lovibond, 1995).

Social Network Index (SNI). The SNI (Berkman & Syme, 1979) is a 11-item social integration measure that assesses the type, size, closeness, and frequency of contacts in the respondent's current social network. Participants are instructed to select the response that most closely describes their current situation for each item (e.g., "How many close friends do you have, people that you feel at ease with, can talk to about private matters?", "Is there someone available to you whom you can count on to listen to you when you need to talk?", "Do you have as much contact as you would like with someone you feel close to, someone in whom you can trust and confide?"). The SNI can be summed into a total score or interpreted into four categories of social connection—socially isolated, moderately isolated, moderately integrated, and socially integrated. The SNI has been widely used as a valid and reliable quantitative measure of the degree of social isolation or social integration.

Interpersonal Support Evaluation List (ISEL). The ISEL (S. Cohen & Hoberman,

1983) is a 40-item perceived social support measure with four subscales that can be summed into a total score: tangible support, belonging support, self-esteem support, and appraisal support. Participants are given statements about availability of support in their lives and are asked to rate the extent to which these are true or false (e.g., "There are several people that I trust to help solve my problems", "I often meet or talk with family or friends", "If I were sick, I could easily find someone to help me with my daily chores") on a 4-point scale (0 = definitely false to 3 =*definitely true*). The ISEL demonstrated good internal reliability (alpha of .77 to .86 in undergraduate students and .88 to .90 in the general population), and good test-retest reliabilities (r = .87 for both a student sample over four weeks and the general population over two days). The ISEL has also demonstrated convergent validity based on other measures of support and quality of relationships, and discriminant validity based on measures of social desirability, social support, or social anxiety.

Inventory of Socially Supportive Behaviours (ISSB). The ISSB (Barrera, Ramsay, & Sandler, 1981) is a 40-item measure of received support, which assesses the quantity of assistance an individual has received in the past month. Participants are asked how often others did particular activities for them, to them, or with them during the past four weeks. For each item (e.g., "Talked with you about some interests of yours", "Comforted you by showing you some physical affection", "Taught you how to do something"), participants are asked to rate the frequency on a 5-point scale (1 = *not at all* to 5 = *about every day*). The ISSB has good internal consistency (coefficient α = .93-.94) and test-retest correlation over two days (r = .88). The ISSB has demonstrated good convergent and discriminant validity based on measures of social

network size and social support: the significant but modest correlations suggest the construct measured by the ISSB and other support measures are related but are distinct.

Test of Negative Social Exchange (TENSE). The TENSE (Ruehlman & Karoly, 1991) is an 18-item measure of unpleasant social interactions. Participants are asked to rate how often people in their lives engaged in each of the items over the past month (e.g., "Lost his or her temper with me", "Took me for granted", "Nagged me") on a 5-point scale (0 = not at all to 4 = about every day). The TENSE demonstrated good internal consistency (alpha coefficients of .70 to.83), and test-retest reliability (.65 to .80 over two days). The TENSE also demonstrated good convergent and discriminant validity through weak correlations with the ISSB and Social Support and Hindrance Inventory Social Hindrance scale.

Results

Data Analytic Plan

Hierarchical multiple regressions were performed on all hypotheses. Variables were meancentered prior to analyses. The four criterion variables of interest, social integration, perceived support, received support, and social conflict were tested separately. All bivariate correlations were presented in a table.

Hypothesis 1: Greater hoarding severity will predict less social support even after accounting for depression.

Four aspects of social support were tested for these sub-hypotheses: (a) greater hoarding severity will predict lower social integration as measured by the SNI, (b) greater hoarding severity will predict less perceived support as measured by the ISEL, (c) greater hoarding severity will predict less received support as measured by the ISSB, and (d) greater hoarding severity will predict more social conflict as measured by the TENSE. Higher scores indicate greater social support for social integration, perceived support, and received support, but higher scores indicate greater social conflict (i.e., less social support). For all sub-hypotheses, a hoarding variable (SI-R Total) was entered in Step 1 to evaluate the predictive ability of hoarding, depression (DASS Depression) was entered in Step 2 to evaluate whether hoarding would remain a unique predictor. Four separate regression analyses were conducted, one for each aspect of social support as the criterion.

Secondary hypothesis 1: Depression will interact with hoarding severity to predict social support. Different levels of depression and hoarding may affect each other, which in turn affect social support. For example, individuals with severe depression may perceive that they have poor social support if they also have mild hoarding problems, but not to the extent of those who also have severe hoarding problems. In Step 3 of each hierarchical regression described above, the interaction between hoarding (SI-R Total) symptoms and depression (DASS Depression) was entered. Interaction terms were calculated by multiplying hoarding variable scores with the depression scores.

Hypothesis 2: Specific hoarding symptoms will uniquely predict social support.

Similar to hypothesis 1, four aspects of social support were tested. To further examine hoarding as a predictor variable, the three subscales of the SI-R and the CIR were also examined. The SI-R subscales assess hoarding symptoms of clutter, difficulty discarding, and excessive acquisition. The CIR was included as a convergent measure of the SI-R Clutter subscale. Clutter was hypothesized to be uniquely predictive of poor social support due to its tangible manifestation in a home compared to other symptoms.

To avoid problems with multicollinearity, each subscale was entered as a predictor individually in separate models rather than entering all subscales into one model. For each criterion, the specific symptom (e.g., SI-R Clutter) was entered in Step 1 and depression (DASS Depression) was entered in Step 2. Thus, four sets of the above regression analyses were conducted (one set for every criterion).

Secondary hypothesis 2: Depression will interact with specific hoarding symptoms to predict social support. Based on a similar rationale described in secondary hypothesis 1, in Step 3 of each hierarchical regression described above, the interaction between each hoarding symptom (CIR, SI-R Clutter, SI-R Difficulty Discarding, and SI-R Acquisition) depression (DASS Depression) was entered in separate models. These interaction terms were also calculated by multiplying hoarding variable scores with depression scores.

Power Analysis

A minimum sample size of 67 was required to detect a medium effect size ($f^2 = .15$) for a multiple regression study, given a probability level of .05, two predictors in the model, and statistical power of .80. The anticipated effect size was determined by the following studies examining psychopathology, namely hoarding and depression, and social support, which demonstrated medium to large effect sizes: Eker and Arkar (1995) found a psychiatric sample had significantly lower perceived social support compared to a normal sample (d = ..72), and Medard (2013) found a hoarding sample had significantly lower social support compared to a community sample (d = .62). Using regression models, Schuster (1990) found that positive and negative support significantly predicted depression ($f^2 = .12-.23$), and Yang (2006) found that perceived social support significantly predicted change in depression from baseline ($f^2 = .43$).

Missing Data

Due to an error made on the online format of the questionnaires, seven items of the SI-R were missing for 40 participants. The seven missing items were distributed across the three subscales: two belonged to the clutter subscale, three to the difficulty discarding scale, and two to the excessive acquisition subscale. Once the error was discovered, it was corrected so that the 38 remaining participants completed the full measure (23 items).

To explore whether participants who completed the 16-item SI-R differed from participants who completed the 23-item SI-R, tests were run to compare the two groups on measured variables. For categorical variables, chi-square tests revealed no significant differences between groups on gender, education, and income. Although a significant difference in recruitment source was found, this difference is explained by timing of the recruitment strategy: members of the registry were invited to participate before advertisements were posted in the
community. Therefore, participants completing the 16-item SI-R were more likely to have been recruited from the registry than were those who completed the 23-item SI-R. For continuous variables, *t*-tests were conducted. Compared to participants who completed the 16-item SI-R, those who completed the 23-item SI-R had significantly lower DASS Depression but significantly higher SNI, ISEL, and TENSE. There were no significant differences between the two groups in age or on the 16-item SI-R, the CIR, and the ISSB. Because the SI-R is the central hoarding measure, it is most important that these two groups of participants did not differ on this measure. Thus, the two groups share similar characteristics, likely come from the same population, and may be merged together as the current study's sample.

Two main options to handle the missing data were considered prior to data analysis: (1) using multiple imputation to fill in missing items to enable analysis of the full 23-item version of the SI-R for all participants or (2) using the 16-item version of the SI-R for all participants. There are strengths and weaknesses to both approaches.

Using the 23-item SI-R with multiple imputation. The approach of multiple imputation was considered for its accuracy over maximum likelihood estimation (for smaller sample sizes) and older methods such as case deletion and single imputation (Schafer & Graham, 2002). Multiple imputation is increasingly implemented and trusted in the literature as a means to retain sample size (Rezvan, Lee, & Simpson, 2015). This option would allow preservation of the full SI-R, leaving the scale validity and reliability unaltered. However, using multiple imputation also has some problems. Most evident, analyses based on imputed data do not pool all statistics. Some statistics are pooled by data analysis software, but the mean of the imputed values for certain parameters (i.e., SDs, R^2 , ΔR^2 , F) would need to be calculated as an approximation of the pooled value. At this time, the reporting of multiple imputation procedures still lacks consensus

(Rezvan et al., 2015). Additionally, the participants who completed the 16-item SI-R were significantly more likely to be recruited from the research registry; therefore the missing values were not completely at random, which decreases the accuracy of multiple imputation.

Using the 16-item SI-R. Analyses using the shortened version of the SI-R would lose potentially useful data provided by the missing seven items. This shortened version also raises questions of scale validity and reliability. Further, direct comparisons cannot be made with existing studies that have used the 23-item SI-R, which would be useful to characterize the current sample as closer to a hoarding or community control group. However, a 23-item SI-R score can be extrapolated from the 16-item SI-R data by linearly transforming scores (i.e., the 16-item SI-R has a maximum score of 64, the 23-item SI-R has a maximum score of 92; therefore, the obtained 16-item SI-R score would be divided by 64 and multiplied by 92 to obtain an extrapolated 23-item SI-R score). Moreover, using the 16-item SI-R may be justifiable due to the lack of significant difference on the 16-item SI-R scores between the first and second group of participants (p = .991). This shortened version would also reflect participants' "true" responses, as these were responses all selected by participants rather than predicted using multiple imputation.

Analyses were conducted using both options. Missing data were imputed using SPSS 20.0. Based on the fraction of missing information and number of imputations needed for maximum efficiency (Graham, Olchowski, & Gilreath, 2007), the analyses utilized m = 10 imputations. No discrepancies in results emerged between the two options of handling missing data. The Cronbach alphas of the 16-item and 23-item versions of the SI-R were excellent, $\alpha =$.94 and .93-.94, respectively. Given these considerations and the identical pattern of findings, the results presented used the 16-item SI-R in the analyses.

Description of Scores

Hoarding symptoms of the current sample were more characteristic of a community sample than a diagnosed hoarding sample. A previous study demonstrated little overlap in SI-R total score distributions between hoarding and community controls (Frost et al., 2004). As previously described, 23-item SI-R scores were extrapolated from the 16-item SI-R scores to compare the current sample with samples in existing research using the SI-R. Table 2 displays a comparison with the extrapolated SI-R scores of the current sample with a hoarding sample and community control sample (Frost et al., 2004). Using the extrapolated scores, 29% (n = 23) of participants in the current sample fell into the hoarding range using the established cut off score of 41 (Frost et al., 2012b). Compared to the estimated prevalence of hoarding in the population of 2-5.8% (Iervolino et al., 2009; Ivanov et al., 2013; Mueller, Mitchell, Crosby, Glaesmer, & de Zwaan, 2009; Samuels et al., 2008; Timpano et al., 2011), the current study included a considerable proportion of hoarding participants.

Depressive symptoms of the current sample fell within the lower limit of the mild range, and anxiety and stress symptoms fell within the normal range (Haggman et al., 2004; P. F. Lovibond & Lovibond, 1995). The first column in Table 3 presents summary statistics for the full sample; the second column will be explained below.

The full correlation matrix is presented in Table 4; all correlations were in the expected direction. In this sample, SI-R hoarding subscales were highly correlated with each other. As expected, the Clutter Image Rating appeared to correlate better with the SI-R Clutter subscale than with the other two SI-R subscales. Surprisingly, DASS Depression was not highly correlated with hoarding variables despite the high co-morbidity between depression and hoarding in the literature. Consistent with previous literature distinguishing different aspects of

social support as unique constructs, the correlations between various aspects of social support were low to moderate, with the exception of the correlation between social integration and perceived support, which was substantially higher. Additionally, social integration and received support were not significantly correlated with hoarding symptoms, but were significantly correlated with depression. Perceived support and social conflict were significantly correlated with both hoarding and depressive symptoms.

Hierarchical multiple regressions were performed to investigate the relation of hoarding and depressive symptoms with various types of social support. To avoid problems with multicollinearity, hoarding variables were not entered together as predictors in the same regressions.

Saving Inventory-Revised (SI-R) Means and Standard Deviations Compared to Clinical and Non-clinical Samples in (Frost et al., 2004)

SI-R	Current sample	Hoarding sample	Community sample
Total	29.2	62.0 (12.7)	23.7 (13.2)
Clutter	11.2	19.8 (5.0)	9.2 (5.0)
Difficulty Discarding	10.2	26.9 (6.6)	8.2 (7.1)
Excessive Acquisition	8.1	15.2 (5.4)	6.4 (3.6)

Note: The full 23-item SI-R total scores presented here were extrapolated from the obtained 16item SI-R scores for the purpose of comparing the current sample (N = 78) with a previous study (Frost et al., 2004), thus standard deviations of extrapolated scores are not presented.

Summary Statistics

Variable	Full Sample M $(SD)^a$	Subsample M (SD) ^b
Saving Inventory-Revised (SI-R) Total (16	20.28 (12.96)	19.61 (12.81)
items only)		
Clutter subscale	8.69 (6.57)	8.14 (6.26)
Difficulty Discarding subscale	5.81 (3.71)	5.78 (3.80)
Excessive Acquisition subscale	5.78 (3.91)	5.69 (3.98)
Clutter Image Rating (mean composite score)	2.36 (1.19)	2.33 (1.28)
DASS Depression	5.68 (5.74)	5.35 (5.56)
Social Network Index	25.04 (7.15)	25.61 (7.79)
Interpersonal Support Evaluation List	75.79 (23.47)	75.37 (26.47)
Inventory of Socially Supportive Behaviours	82.06 (27.37)	84.67 (30.63)
Test of Negative Social Exchanges	17.74 (16.32)	16.29 (15.04)

Note: ${}^{a}N = 78$ (full sample); ${}^{b}n = 51$ (excluding participants who took less than 20 minutes to complete the survey).

Correlations Matrix

Measure	1	2	3	4	5	6	7	8	9	10
1. SI-R Total	-									
2. SI-R Clutter	.94**	-								
3. SI-R Difficulty Discarding	.89**	.71**	-							
4. SI-R Acquisition	.90**	.74**	.79**	-						
5. Clutter Image Rating	.63**	.69**	.46**	.50**	-					
6. DASS Depression	.30**	.30**	.22	.28*	.19	-				
7. Social Network Index	17	22	11	11	07	48**	-			
8. ISEL	30**	31**	24*	26*	21	65**	.74**	-		
9. ISSB	15	16	11	10	08	23*	.36**	.53**	-	
10. TENSE	.34**	.34**	.27*	.28*	.28*	.62**	23*	34**	.09	-

Note: SI-R = Savings Inventory-Revised; results displayed are from the 16-item version. DASS = Depression Anxiety Stress Scale-21; ISEL = Interpersonal Support Evaluation List; ISSB = Inventory of Socially Supportive Behaviours; TENSE = Test of Negative Social Exchange.

 $*p \le .05. **p \le .01.$

Extreme Values and Assumption Checks

Univariate and multivariate outliers were explored by examining standardized residual values and Cook's distances. Prior to regression analyses, preliminary analyses were performed to ensure there were no violations of assumptions. To check the assumption of independent errors, the Durbin-Watson test was conducted; to check the assumption of homoscedasticity, scatterplots of standardized residuals plotted against standardized predictor values were examined; to check the assumption of normally distributed errors, histograms and a normal probability plot were examined; to check the assumption of no multicollinearity, the correlation matrix was scanned for highly correlated predictors and the Variance Inflation Factors were examined. These analyses revealed no violated assumptions, except for highly correlated predictors among the SI-R subscales. Upon examination of data points outside of $Z = \pm 2.5$, outliers of different measures were not repeatedly from the same participant and therefore not cause for serious concern.

Hoarding (Total) Symptoms as a Predictor of Social Support (Hypothesis 1)

Results discussed below are presented in Table 5.

Social integration. The Social Network Index measured social integration. As expected based on the bivariate correlation coefficient, SI-R Total (hoarding symptoms) was not a significant predictor of social integration in Step 1, but depression as measured by DASS was a significant predictor in Step 2. No significant interaction was found in Step 3.

Perceived support. The Interpersonal Support Evaluation List measured perceived support. SI-R Total (hoarding symptoms) was a significant predictor in Step 1, but was not a unique predictor of perceived support after depression was entered in Step 2. Depression was a significant predictor. No significant interaction was found in Step 3.

Received support. The Inventory of Socially Supportive Behaviours measured received support. Neither SI-R Total entered in Step 1 nor DASS Depression entered in Step 2 was a significant predictor of received support. No significant interaction was found in Step 3.

Social conflict. The Test of Negative Social Exchange measured social conflict. SI-R Total (hoarding symptoms) was a significant predictor in Step 1, but became marginally significant as a predictor after depression was entered in Step 2. Depression was a significant predictor. No significant interaction was found in Step 3.

In sum, SI-R Total significantly predicted perceived support and social conflict, but was not significantly associated with social integration or received support. Depression significantly accounted for social integration, perceived support, and social conflict, but not received support. After accounting for depression in Step 2, hoarding symptoms marginally predicted social conflict but did not uniquely predict perceived support. No interaction was found between SI-R Total and DASS Depression for any aspect of social support.

Hierarchical Multiple Regression Analyses Predic	ing Social Integration	, Perceived Support,	Received Support,	and Social Conflict
from SI-R Hoarding (Total) and Depressive Symp	oms			

	Social Support Variable											
	Socia	l Integrati	on (SNI)	Percei	ved Suppo	ort (ISEL)	Receiv	ved Suppo	ort (ISSB)	Social	Conflict	(TENSE)
Predictor	ΔR^2	β	р	ΔR^2	β	р	ΔR^2	β	р	ΔR^2	β	р
Step 1	.03			.09			.02			.11		
SI-R Total		17	.131		30	.007		15	.201		.34	.003
Step 2	.20			.35			.04			.29		
SI-R Total		03	.766		12	.198		09	.469		.16	.084
DASS Depression		47	.000		62	.000		20	.091		.57	.000
Step 3	.01			.02			.03			.01		
SI-R Total		05	.628		15	.110		12	.325		.14	.138
DASS Depression		48	.000		64	.000		23	.058		.55	.000
SI-R Total \times		.11	.304		.16	.085		.17	.150		.12	.217
DASS Depression												
Total R^2	.24			.46			.08			.42		

Note: N = 78. SI-R = Savings Inventory-Revised; results displayed are from the 16-item version. DASS = Depression Anxiety Stress Scale-21; SNI = Social Network Index; ISEL = Interpersonal Support Evaluation List; ISSB = Inventory of Socially Supportive Behaviours; TENSE = Test of Negative Social Exchange.

Specific Hoarding Symptoms as Predictors of Social Support (Hypothesis 2)

Several hierarchical multiple regressions were conducted to investigate hypothesis 2 – whether clutter accumulation uniquely predicts social support. As demonstrated in Table 4, specific hoarding symptoms were not highly correlated with social integration or received support (rs = -.10 to -.22). Regression analysis echoed these results; none of the specific hoarding symptom variables were significant predictors of social integration or received support, $Fs (1, 76) < 3.70, ps > .06, R^2s < .05$, and there was no significant interaction between any hoarding variable and depression for either social integration or received support, $\Delta Fs (1, 74) < 3.15, ps > .08, \Delta R^2s < .04$. These two social support variables will not be considered further.

In contrast, specific hoarding symptoms were moderately and significantly correlated with perceived support and social conflict. Analyses for these two aspects of social support are discussed below and displayed in Table 6.

Perceived support. The two measures of clutter demonstrated some nuanced differences in results. The CIR was marginally significant as a predictor when entered in Step 1. After accounting for depression in Step 2, the CIR did not uniquely predict perceived support. There was no significant interaction in Step 3. However, SI-R Clutter was a significant predictor when entered in Step 1, but Step 2 showed that depression accounted for this result. This main effect should be viewed in light of the significant interaction in Step 3. Depression moderated the relationship between SI-R Clutter and perceived support. More depressed participants perceived low levels of support, regardless of clutter severity. For those with few symptoms of depression, however, perceived support depended on clutter severity. Perceived support was high for those with low levels of clutter, but perceived support was low among non-depressed participants with high levels of clutter (Figure 1). The other two SI-R subscales (difficulty discarding and excessive acquisition) had a similar pattern of results, which was consistent with SI-R Total; both subscales were significant predictors when entered in Step 1, but each was no longer a significant predictor after depression was entered in Step 2; depression was a significant predictor, and there was no significant interaction in Step 3.

Upon further examination, both CIR and SI-R Clutter had considerably higher correlations with perceived support compared to SI-R Difficulty Discarding and SI-R Acquisition symptoms. Correspondingly, SI-R Clutter appeared to have a larger effect on perceived support compared to SI-R Difficulty Discarding and SI-R Acquisition.

Social conflict. The CIR was a significant predictor for social conflict when entered in Step 1, but it became only marginally significant as a predictor after depression was entered in Step 2; depression was a significant predictor, and there was no significant interaction in Step 3. Note that the CIR was not a significant predictor for any other aspect of social support.

Each of the three SI-R subscales was a significant predictor when entered in Step 1, but small differences emerged in Step 2: both measures of clutter (CIR and SI-R Clutter) became only marginally significant as predictors, whereas SI-R Difficulty Discarding and SI-R Acquisition were not significant predictors. There was no significant interaction in Step 3.

Upon further examination, both CIR and SI-R Clutter had considerably higher correlations with social conflict compared to SI-R Difficulty Discarding and SI-R Acquisition symptoms. Correspondingly, not only did SI-R Clutter have a larger effect compared to SI-R Difficulty Discarding and SI-R Acquisition, both CIR and SI-R Clutter were marginally significant as predictors even when depression was entered in Step 2, whereas SI-R Difficulty Discarding and SI-R Acquisition were no longer significant predictors. In sum, in Step 1 of separate models, SI-R subscales (clutter, difficulty discarding, and acquisition) predicted perceived support and social conflict, whereas the CIR predicted social conflict but only marginally predicted perceived support. However, in Step 2, hoarding variables were either only marginally significant or no longer significant as predictors when depression was entered. The hoarding variables predicted neither social integration nor received support. In Step 3, a significant interaction was only found between SI-R Clutter and depression for perceived support.

	Social Support Variable							
	Perce	ived Suppo	ort (ISEL)	Socia	(TENSE)			
Predictor	ΔR^2	β	р	ΔR^2	β	р		
Step 1	.05			.08				
Clutter Image Rating		21	.059		.28	.013		
Step 2	.39			.33				
Clutter Image Rating		10	.279		.17	.060		
DASS Depression		63	.000		.58	.000		
Step 3	.00			.00				
Clutter Image Rating		11	.241		.16	.096		
DASS Depression		64	.000		.58	.000		
Clutter Image Rating \times		.05	.609		.05	.579		
DASS Depression								
Total R^2	.44			.41				
Step 1	.10			.12				
SI-R Clutter		31	.006		.34	.002		
Step 2	.34			.29				
SI-R Clutter		12	.178		.17	.072		
DASS Depression		62	.000		.56	.000		
Step 3	.04			.01				
SI-R Clutter		19	.045		.14	.161		
DASS Depression		64	.000		.55	.000		
SI-R Clutter ×		.22	.016		.11	.232		
DASS Depression								
Total R^2	.48			.42				
Step 1	.06			.08				
SI-R Difficulty Discarding		24	.035		.27	.015		
Step 2	.38			.32				
SI-R Difficulty Discarding		10	.269		.14	.120		
DASS Depression		63	.000		.58	.000		
Step 3	.01			.00				
SI-R Difficulty Discarding		12	.202		.14	.150		
DASS Depression		64	.000		.58	.000		
SI-R Difficulty Discarding ×DASS Depression		.09	.319		.04	.682		
Total R^2	.44			.40				

Hierarchical Multiple Regression Analyses Predicting Perceived Support and Social Conflict from Various Hoarding Symptoms and Depressive Symptoms

		Social Support Variable							
	Perce	ived Supp	ort (ISEL)	Socia	(TENSE)				
Predictor	ΔR^2	β	р	ΔR^2	β	р			
Step 1 SI-R Acquisition	.07	26	.021	.08	.28	.014			
Step 2 SI-R Acquisition DASS Depression	.36	08 63	.357 .000	.31	.11 .58	.234 .000			
Step 3 SI-R Acquisition DASS Depression SI-R Acquisition × DASS Depression	.00	09 64 .07	.321 .000 .472	.01	.10 .56 .12	.297 .000 .192			
Total R^2	.44			.40					

Note: N = 78. SI-R = Savings Inventory-Revised; results displayed are from the 16-item version. DASS = Depression Anxiety Stress Scale-21; ISEL = Interpersonal Support Evaluation List; TENSE = Test of Negative Social Exchange.



Figure 1. Interaction of DASS Depression and SI-R Clutter Symptoms on Perceived Support.

Confidence in Findings

In this preliminary online study, the time participants took to complete the survey was recorded. Some participants completed the survey extremely quickly, which raised concerns regarding the extent to which these participants thoroughly read and considered their responses. Thus, duration to complete the survey was used as an indicator of considerate responses. As mentioned earlier, at the outset, six participants were excluded on the basis of completing the survey in less than ten minutes, which was deemed as an inadequate amount of time to actually read and respond to all items. (Two independent test runs of the survey, by highly educated native English speakers, took approximately 20-25 minutes to complete, and several participants who were sufficiently motivated to come into the research lab to complete the survey finished in 13-16 minutes.) The decision to exclude participants who took less than ten minutes was nonetheless a relatively arbitrary criterion. Of the remaining 78 participants (i.e., after excluding the 6 who took less than 10 minutes), six (8%) completed the questionnaire in 10-15 minutes, 21 (27%) completed the questionnaire in 15-20 minutes, and 51 (65%) completed the questionnaire in over 20 minutes. As a conservative check, I repeated the analyses described above, using data that excluded participants who took under 20 minutes. The second column of means in Table 3 presents summary statistics for this subgroup, which appear to be quite similar to those of the full sample.

When the results presented in Table 5, involving SI-R Total, were re-examined with the smaller sample of respondents who took at least 20 minutes to complete the study, the pattern of results was unchanged. When re-examining regression analyses involving specific symptoms of hoarding, the pattern of results for social integration and received support was unchanged from those described earlier with the full sample. Turning to the relation between specific hoarding

symptoms and perceived support and social conflict, the overall pattern was the same as presented in Table 6, but there were subtle differences in findings for interactions, which are shown in Table 7, Figure 2 and Figure 3.

For perceived support, the significant interaction observed between SI-R Clutter and depression in the full sample was not significant in the sample of slower responders. Instead, an interaction between SI-R Difficulty Discarding and depression was observed. This interaction demonstrated a different pattern than the pattern observed for clutter and depression in the full sample. Participants who had little difficulty discarding perceived high support availability if they had few symptoms of depression, and perceived low support availability if they had high depression symptoms. Participants who had high difficulty discarding rated moderate perceived support, regardless of depression severity (*Figure 2*).

For social conflict, the full sample had shown no interaction between any specific hoarding symptom and depression. Using the smaller sample of slower responders, depression moderated the relation between SI-R Acquisition and social conflict. Participants who had high excessive acquisition had more social conflict if they had high depression symptoms, and less social conflict if they had fewer symptoms of depression. Participants who had low excessive acquisition rated moderate social conflict, regardless of depression severity (*Figure 3*). Note the opposite valence of social conflict to other social support variables.

In sum, most of the findings in the full sample were replicated in the confident sample of participants. Some differences among interactions of the SI-R subscales were demonstrated; nevertheless, the interactions showed a similar pattern of how specific symptoms of hoarding may affect different aspects of social support.

Hierarchical Multiple Regression Analyses Predicting Perceived Support and Social Conflict from Various Hoarding Symptoms and Depressive Symptoms for Participants who Completed the Survey in over 20 Minutes

	Social Support Variable								
	Perce	vived Supp	ort (ISEL)	Social Conflict (TENSI					
Predictor	ΔR^2	β	р	ΔR^2	β	р			
Step 1	.06			.11					
Clutter Image Rating		24	.085		.32	.021			
Step 2	.48			.29					
Clutter Image Rating		08	.444		.20	.099			
DASS Depression		71	.000		.55	.000			
Step 3	.005			.01					
Clutter Image Rating		11	.338		.15	.222			
DASS Depression		72	.000		.53	.000			
Clutter Image Rating \times		.08	.477		.12	.325			
DASS Depression									
Total R^2	.54			.41					
Step 1	.11			.09					
SI-R Clutter		32	.020		.31	.030			
Step 2	.44			.28					
SI-R Clutter		13	.204		.15	.215			
DASS Depression		69	.000		.56	.000			
Step 3	.02			.02					
SI-R Clutter		18	.094		.10	.419			
DASS Depression		69	.000		.56	.000			
SI-R Clutter \times		.15	.159		.13	.277			
DASS Depression									
Total R^2	.56			.39					
Step 1	.06			.08					
SI-R Difficulty Discarding		25	.072		.28	.045			
Step 2	.47			.29					
SI-R Difficulty Discarding		02	.843		.10	.418			
DASS Depression		72	.000		.57	.000			
Step 3	.05			.00					
SI-R Difficulty Discarding		06	.586		.09	.476			
DASS Depression		81	.000		.54	.000			
SI-R Difficulty Discarding ×		.24	.027		.07	.579			
DASS Depression Total P^2	50			27					
I Utal K	.38			.37					

	Social Support Variable								
	Perce	Perceived Support (ISEL)			Social Conflict (TEN				
Predictor	ΔR^2	β	р	ΔR^2	β	р			
Step 1	.05			.08					
SI-R Acquisition		22	.119		.29	.042			
Step 2	.48			.29					
SI-R Acquisition		.00	.976		.11	.355			
DASS Depression		73	.000		.56	.000			
Step 3	.01			.08					
SI-R Acquisition		00	.972		.09	.414			
DASS Depression		77	.000		.45	.001			
SI-R Acquisition ×		.11	.300		.31	.012			
DASS Depression									
Total R^2	.54			.45					

Note: n = 51. SI-R = Savings Inventory-Revised; results displayed are from the 16-item version. DASS = Depression Anxiety Stress Scale-21; ISEL = Interpersonal Support Evaluation List; TENSE = Test of Negative Social Exchange.



Figure 2. Interaction of DASS Depression and SI-R Difficulty Discarding Symptoms on Perceived Support.



Figure 3. Interaction of DASS Depression and SI-R Acquisition Symptoms on Social Conflict.

Discussion

Hoarding (Total) Symptoms as a Predictor of Social Support

Findings demonstrated that hoarding is related to certain aspects of social support. Hoarding is associated with the amount of support individuals perceive to be available if need arises, and with the amount of negative social exchanges they experience. Hoarding is not, however, associated with how socially integrated individuals are, nor with the amount of support that they obtained in their recent past. Depression explained these relationships, suggesting that hoarding is relevant to social support through depression.

Social integration. Based on the few studies that suggest individuals who hoard tend to be never-married and live alone, as well as clinical observations that people who hoard tend to be socially isolated, hoarding was expected to be associated with low social integration. Additionally, shame and stigma surrounding the issue of hoarding were reasons to expect low social integration (and thus imply fewer relationships and less community engagement). On the contrary, findings in the current study suggest that hoarding is unrelated to social integration. Aligned with this result, out of the participants who have clinical levels of hoarding in the present study (29% (n = 23), only 30% (n = 7) live alone and only 13% (n = 3) belong in the category of having the "fewest connections" in Social Network Index. In general, more studies are needed to characterize this idiosyncratic population. Features that have been examined include prevalence, developmental trajectory and age, gender differences, and comorbidity (Frost et al., 2012b). In comparison, however, social environmental factors such as living situation, marital status, and size of homes have been insufficiently explored, and only a few studies include some of these factors as part of basic sample characteristics (Ayers et al., 2013; H.-J. Kim et al., 2001; Muroff et al., 2010; Tolin, Frost, Steketee, Gray, & Fitch, 2008c).

The current study's hypothesis regarding social integration is based on the idea that those who are not highly integrated have fewer people to invite into their homes; however, social interactions and relationships do not necessarily depend on visits. Although some individuals who hoard may wish to remain at home and thus become socially isolated, others may wish to avoid their home for reasons such as being unable to comfortably rest on a couch or a bed. This second group may still be socially integrated without inviting others over if they are highly engaged in the community.

Social integration measures number of friends and community engagement, but does not distinguish between relationships or interactions that occur in the home versus in the community. This would explain the somewhat discrepant descriptions for this sample: even though about a third of the participants lived alone, a much smaller proportion had very few social connections. Thus, participants' living situation (suggestive of home interactions) and social connectedness (more suggestive of community engagement) did not correspond and seem to describe different characteristics. In other words, living situation might be a rough estimate of how much support is present, but living alone does not necessarily mean having fewer connections. These differences need further exploration with a particular emphasis on interactions that occur inside the home, including both people who reside with individuals who hoard, and friends and family members who visit their homes.

Many researchers believe that behavioural expectation is the main mechanism through which social integration is related to positive outcomes. That is, people surrounding the individual provide social norms that facilitate healthy behaviours and inhibit risky behaviours (Lewis & Rook, 1999; Umberson, 1987). In hoarding, greater presence of people in the individual's environment may be related to hoarding symptoms. Tolin et al. (2008c) found that

hoarding participants who were married or cohabitating had less severe hoarding symptoms than participants who were single, divorced, or widowed. Tolin et al. (2010) found that hoarding typically begins early but remains mild until mid-adulthood, possibly due to the individual achieving physical and financial independence. Clinical experiences of Tolin et al. (2010) also suggest that hoarding severity increases when external constraints are removed, such as when individuals leave parents' homes or lose intimate partners. Together, the presence of others in the home seems to inhibit clutter, even if problems with discarding and acquisition may not be altered.

The current cross-sectional study suggests that hoarding is unrelated to social integration; however, longitudinal studies are warranted to test whether placing or removing these external constraints on the individual change hoarding behaviours over time. Additionally, this raises questions about the nature of external constraints: is change, whether exacerbation or improvement in symptoms, related to the number of people present in the individual's home? For example, future studies may examine whether one person (i.e., a spouse) is enough to make a substantial difference, or whether having a greater number of family members around is more effective. Also, the quality of implicit or explicit communication about housekeeping norms may affect hoarding behaviours, as well as the dynamics between individuals in a home. For example, if the individual who hoards has the most dominant personality within a home, the presence of others may have less of an inhibitory effect on hoarding. If the individual who hoards is a child, the presence of parents or guardians is likely to have a greater inhibitory effect due to housekeeping rules. Related to this, individuals with hoarding problems seem to actively integrate themselves into support groups (Muroff et al., 2010). There may be a difference in

outcome between those who actively seek out support and wish to relate to others for specific problems compared to those who do not, regardless of their current level of social integration.

Perceived support. Of the different types of social support, perceived support has been the most strongly associated with positive outcomes, specifically with lower stress and better physical and mental health (S. Cohen, Kaplan, & Manuck, 1988b; Yang, 2006). As expected, hoarding was related to perceived support, though depression fully accounted for this relationship. The current results are consistent with previous research that a strong relationship has been found between depression and perceived support (Eker & Arkar, 1995). People with depression may underestimate how much support they have, even when family members, housing providers, and community agencies—people who may be trying to provide assistance are available. Individuals with depression may also perceive that these potential support providers are unavailable to provide a particular type of support they need, such as emotional support, even though they are physically available. However, people with depression may indeed have less support available to them because being around depressed people, especially if they are chronically depressed, can be frustrating and requires much patience.

Stigma surrounding hoarding and depression may also have implications for perceived support. Individuals may conceal that they are suffering from hoarding and depression, as many people with mental illnesses are able to do so without peers being aware (Corrigan, 2004). Stigmatized individuals may see the benefits of seeking support, such as increased psychological well-being and receiving necessary assistance from others. Yet, the costs of self-consciousness and social disapproval or avoidance of others may seem like a hindrance that they cannot overcome (Corrigan & Matthews, 2003). Stigma has been distinguished into two types: public stigma, how the public treats the stigmatized group when they are prejudiced against that group,

and self-stigma, how the individuals of the stigmatized group perceive or treat themselves if they internalize the public stigma (Corrigan, 2004). Public stigma may rob individuals of social opportunities such as jobs, housing, and even health care services; thus, understandably, people with concealable stigmas often decide to avoid this harm by hiding aspects of themselves (Corrigan, 2004). Through the lens of comorbid depression, self-stigma in hoarding may be amplified and more readily internalized, increasing the accompanying self-consciousness and self-criticism. Although anecdotal evidence suggests that people who hoard are stigmatized, research is needed to examine how stigma functions and varies among individuals in this particular group. Individuals who are affiliated with stigmatized individuals, such as family members, friends, and service providers, may also be subject to stigma (Mak & Cheung, 2008). The frustration among family members towards individuals with hoarding (Tolin, Frost, Steketee, & Fitch, 2008b) and the affiliate stigma that family members feel may affect how they act towards the individual, leading the individual to perceive lower available support.

Received support. The current study found that neither hoarding nor depression was related to received support. Previous research on received support outcomes has been mixed, even for depression (Krause & Markides, 1990; Reinhardt et al., 2006). Some studies found an association between high received support and more stable mental and physiological health (Norris & Kaniasty, 1996; Thorsteinsson & James, 1999); others have found an association between high received support and more mental problems (Iwata & Suzuki, 1997). These contradictory findings may be because people who receive little support have poor outcomes, but it is also possible that people receive ample support when their circumstances are severe. Furthermore, even when people receive support, it is unclear whether support led to better long-term outcomes. Therefore, the current finding that both hoarding and depression were unrelated

to received support is less surprising—the amount of support received may not actually improve the problems of hoarding or depression.

How depression was measured may also be a factor. Interestingly, a previous study found that received support positively correlated with clinician ratings of depressive symptoms (r = .23), but did not correlate with self-reported depressive symptoms (r = .05), whereas perceived support was negatively correlated with self-reported depressive symptoms (r = .42), but did not correlate with clinician ratings of depressive symptoms (r = .07; Brummett, Barefoot, Siegler, & Steffens, 2000). Although this study used the Center for Epidemiological Studies Depression Scale and the Duke Social Support Index, the same constructs were measured. Consistent with Brummett et al.(2000), the current study found that self-reported depression correlated with perceived support but not received support. At this time, it remains unclear why different ways of measuring depression demonstrates different results.

Outcomes of received support may be dependent on context and the potential stressor, and on characteristics of the support provider and the recipient (Helgeson et al., 2000; Nurullah, 2012; Uchino, 2009). The Inventory of Socially Supportive Behaviours (ISSB) is an established measure for received support, but it only asks for specific acts of support the respondent obtained recently; it does not ask about the context of these behaviours and current stressors in the respondent's life, or about the respondent's relationship with support providers. Outcomes of received support may rely on many factors: who the provider is and how support was provided, the circumstances the recipient is experiencing, and whether the received support alleviated any particular stressor. Thus, to evaluate received support in isolation may be an oversimplification of actual experience.

The ISSB measures the extent to which respondents received specific acts of support but it might not assess hoarding-relevant aspects of received support. Although the ISSB has items that could be extended to hoarding (e.g., "assisted in setting a goal for yourself" or "pitched in to help you do something that needed to get done"), ISSB items do not specifically address hoarding-relevant issues. The ISSB measures general needs, but hoarding problems require specific types of assistance, such as emotional support when making difficult discarding decisions, or rides to donation bins. In a sense, the ISSB assumes that all respondents have the same baseline of needs that may be met by others who offer supportive acts. The measure does not assess for how much support the respondent needed or how much the respondent sought support for that need. For individuals who hoard, the support they receive in proportion to their needs or specific to their needs are of greater interest. Therefore, the ISSB was a good preliminary measure to assess received support in hoarding, but a more targeted study may be better to assess more hoarding-relevant aspects of received support within hoarding samples.

People who hoard may experience varying levels of stress that depend on their insight. This is important because research has shown that received support may be ineffective under stress (e.g., Gottlieb, 2000). If insight is fairly good, these individuals may feel stressed knowing that they need to deal with the clutter in their home. If insight is poor, they may underestimate the extent of their hoarding problem and thus experience less stress. However, the problem becomes more complicated if people in their home or landlords pressure individuals to address their clutter problem for health and safety reasons, which can be an additional source of stress, regardless of the individual's level of insight. Without family members or friends' informant data, insight is a difficult issue to address. Similarly, even though many received support

measures have high inter-observer reliabilities (between the respondent and close others), future studies may explicitly incorporate other ways of gathering data such as informant ratings.

Received support is multidimensional, but current measures do not distinguish between different types of received support such as unsolicited support and invisible support. These concepts may be important to help researchers understand the mixed findings of received support in the literature. The term unsolicited support refers to support that is passively obtained without being sought out. In the literature, however, unsolicited support more often has the negative connotation of unpleasant support. When unsolicited support is unwanted, inappropriately delivered, or mismatched to recipients' needs, it may undermine autonomy and personal choice, trigger upward social comparisons, and create various negative feelings such as incompetence, indebtedness, anxiety, and depression (Barrera, 1986; Bolger & Amarel, 2007; Deelstra, Peeters, Schaufeli, Stroebe, & Zijlstra, 2003; Eckenrode & Wethington, 1990; Kahn & Antonucci, 1980; J. Smith & Goodnow, 1999; Song & Chen, 2014; Woloshin et al., 1997). Consequently, compared to nonrecipients of unsolicited support, recipients have poorer health outcomes (e.g., S. Cohen et al., 2000; Harber, Schneider, Everard, & Fisher, 2005; Reinhardt et al., 2006; M. S. Walker, Zona, & Fisher, 2006), including more negative physiological reactions such as increased heart rate and respiratory sinus arrhythmia (Deelstra et al., 2003). Recipients of unsolicited support also have more depressive symptoms than nonrecipients; however, recipients with a greater need for support demonstrated less harmful effects (Bolger & Amarel, 2007; Deelstra et al., 2003; Song & Chen, 2014), thus reinforcing the importance of exploring whether received support matches the recipient's need. Interestingly, people who have network members aware of their needs may have a higher chance of receiving unsolicited support and generating

conflict (e.g., Harber et al., 2005). This issue is again complicated by insight—individuals with hoarding problems in addition to poor insight may underestimate their need for support.

Unsolicited support in hoarding may include unilaterally making sorting, organizing, acquiring, or discarding decisions for the individual who hoards, who, as a result, perceive these behaviours as distressing and unhelpful. Patients of other illnesses may have similar experiences. Coronary syndrome patients recognize that support providers "mean well" and "worry because they care", but still found many acts of unsolicited support stressful, including high expression of emotions, unsolicited advice, information or assistance, information without means for implementation, and taking over (Boutin-Foster, 2005). Similarly, network members of people who hoard may be coercive in helping with decisions, and imply that they know best. Admittedly, the balance between enforcing cleanliness and safety and respecting privacy can be difficult to achieve. As a result, people with severe clutter are often coerced into discarding treasured possessions before they are ready. In extreme cases, strangers from de-cluttering agencies may discard the resident's possessions by the truckload, violating the individual rights of the resident. Support provided can be objectively beneficial, but how support is received may matter the most. Thus, the distinction between solicited and unsolicited support is necessary in received support, and perhaps is more important than distinguishing between helpful or unhelpful support. Different cultures have been found to respond uniquely to solicited and unsolicited support (Mojaverian & Kim, 2013), which leaves the possibility that a hoarding group may also respond distinctively to solicited versus unsolicited support.

Unsolicited support can be beneficial when it reinforces people's expectations of perceived support availability and when it protects recipients without acknowledging weaknesses (Eckenrode & Wethington, 1990; Thoits, 2011). This type of unsolicited support is referred in

the literature as invisible support—support that goes unnoticed by the recipient, or is subtle enough not to be interpreted as support. Unsolicited support may be confounded with negative feelings of violation or guilt (Bolger & Amarel, 2007; Gleason et al., 2003), leading to tension in the relationship, whereas invisible support instead reduces emotional reactivity (and likely feelings of being misunderstood, judged, or stigmatized) due to maintaining the recipient's sense of efficacy (Bolger et al., 2000; Bolger & Amarel, 2007). In hoarding, an example of invisible support from family members may be quietly and thoughtfully discarding some possessions with the knowledge that the individual deals with loss better when he or she is unsure of what is missing; an example of unsolicited support might be forcefully, indiscriminately, and perhaps less thoughtfully discarding the individual's possessions without permission. Items on the ISSB are unable to distinguish between supportive behaviours that were solicited and unsolicited, and the definition of invisible support precludes the recipient's awareness that support occurred. At this time, both constructs of unsolicited support and invisible support require further study in the context of hoarding.

Social conflict. The emotional nature of many psychological problems may be a source of frustration; hoarding, however, also involves physical obstacles (i.e., clutter) that may become an additional source of interpersonal conflict. Indeed, a study examining family burden showed that hoarding is a significant source of distress within the family (Tolin, Frost, Steketee, & Fitch, 2008b). The current study found that hoarding is associated with social conflict through depression, which frequently accompanies hoarding. This finding is consistent with longestablished findings that depression is related to negative social interactions (Finch et al., 1999; Okun & Keith, 1998; Pagel et al., 1987; Schuster et al., 1990). More recently, depression has been found to relate with conflict in various ways. For example, Heene, Buysse, and van Oost

(2007) found that greater depressive symptoms and greater marital distress were associated with poorer perceptions about conflict communication and causal attributions and Kane and Garber (2004) found that paternal depression was significantly associated with father-child conflict in their meta-analysis.

Conflict associated with hoarding through depression may work similarly to these studies. People with hoarding and depression may have more family conflict, which might be related to (perceived) poor conflict communications and causal attributions—that the other party is to blame as the cause for conflict. In addition, depression may account for the social conflict involved because of symptoms such as lack of energy and motivation. Even though hoarding symptoms may create tension between the person who hoards and others, perhaps the negativity, lack of initiation, and lack of determination to change stemming from depression may be the most frustrating for others to deal with even in the context of hoarding. For instance, an individual's inability to get started, inability to maintain motivation, or negative attitude towards progress may be the sources of conflict. In this situation, the spouse might feel frustrated and disrespected, and the individual who hoards might feel misunderstood and unsupported.

Beyond the above explanation, the type of social conflict that results from hoarding behaviours may be qualitatively different from that due to depression. However, this requires further exploration. Symptoms of depression may fathomably create more passive negative interactions; for example, support providers may lose patience and become frustrated at the persistent lack of energy and motivation despite constant encouragement. However, symptoms of hoarding may create more active negative interactions; for example, family members may become angry and intolerant of clutter, and lack empathy for difficulty discarding and excessive acquisition symptoms that contribute to the state of their home. Additionally, depressive

symptoms of an individual may only affect co-workers, friends, and family, whereas hoarding symptoms of an individual may also affect neighbours, and even distant others such as landlords and housing providers. In extreme cases of hoarding, the urgency to manage hoarding symptoms due to eviction threats would be an additional source of stress and likely cause more overt conflict. Presently, the different qualities of conflict described above and more generally the relationship between depression and conflict in hoarding remains unknown.

The means and correlations of the TENSE were examined to compare different populations with the current sample. The TENSE means in the present community sample (M =17.74, SD = 16.32) was very similar to the TENSE means in an undergraduate sample of a previous study (M = 17.90, SD = 12.30) by Edwards et al. (2001). Correlations between TENSE and different measures of self-reported depression in the literature correlated r = .41 in an undergraduate sample (Finch & Graziano, 2001) and r = .44 in a psychiatric treatment-seeking sample (Dunkley, Sanislow, Grilo, & McGlashan, 2006). Between different measures of conflict and self-reported depression, an older community sample found a similar correlation of r = .41; however, a different undergraduate sample found a correlation of r = .15. In the current study, TENSE and depression correlated r = .62, which is substantially higher than previous studies. This considerably higher correlation may indicate that a sample with both hoarding and depressive symptoms has greater amounts of social conflict compared to psychiatric (mostly depression) samples without hoarding. Given that one-third of the current sample may be considered to have clinical levels of hoarding and that social conflict remained marginally significant after depression was accounted for, the unique predictive ability of hoarding for social conflict may remain as a possibility worth exploring.

Existing literature suggest negative interactions have a stronger effect than positive interactions (Finch, Okun, Pool, & Ruehlman, 1999). However, questions of how negative social exchanges interact with positive social exchanges, and how each may leave a long-term impact still remain. Newsom, Nishishiba, Morgan, and Rook (2003) have found that negative exchanges have a longer-lasting negative impact compared to positive exchanges for positive impact, at least over several months. In an undergraduate sample, rather than positive social interactions, the absence of negative social interactions was associated with better physical health (Edwards et al., 2001); this raises the likely possibility that this finding may also be true for psychological health, but existing research has yet to directly examine this question. Moreover, research suggests having constant and stable negative social exchanges predict lower self-rated health, greater functional limitations, and poorer health over two years (Newsom, Mahan, Rook, & Krause, 2008). Conflicts due to pervasive symptoms of hoarding are likely a daily occurrence, especially if the individual who hoards does not live alone; thus, highlighting the need to understand the relationship between hoarding and conflict to prevent long-standing negative outcomes for these individuals.

Specific Hoarding Symptoms as Predictors of Social Support

Specific hoarding symptoms may be a cause or consequence of poor social support. In particular, compared to difficulty discarding and acquisition, clutter symptoms were thought to have the strongest relation with social support due to physical manifestations of clutter symptoms. Others cannot see symptoms of difficulty discarding or excessive acquiring, unless those symptoms manifest in clutter accumulation, which can lead to stigma and potentially negative exchanges. In the current study, the same findings appeared to hold true across specific symptoms of hoarding, contrary to expectation that clutter would have the strongest relationship. In other words, clutter, difficulty discarding, and acquisition, as measured by the Saving Inventory-Revised (SI-R), were all related to perceived support and social conflict, but depression explained those relationships. Clutter, as measured by the Clutter Image Rating (CIR), was weakly related to perceived support and was related to social conflict, again, better accounted by depression. Upon further examination, however, clutter symptoms appeared to have stronger relationships with perceived support and social conflict compared to difficulty discarding and acquisition symptoms. In particular, both CIR and SI-R Clutter remained marginally related to social conflict even when depression was considered, which suggests that whether clutter is related to social conflict above and beyond the relationship between depression and social conflict should be further investigated.

Hoarding (total) symptoms appear to sufficiently capture the relationship with social support. This community sample of people with mild or no hoarding symptoms suggests that specific symptoms of clutter, difficulty discarding, and excessive acquisition may be equally difficult to deal with deal with. For example, clutter may be the most salient problem, causing physical obstacles; however, if a support provider is concerned about health and safety in the home, difficulty discarding and excessive acquisition are symptoms that maintain and contribute to clutter, and might be similarly problematic. Difficulty discarding and excessive acquisition symptoms are difficult for others to understand: getting rid of items appears to be an easy task to people who do not hoard, and they often do not understand the extreme difficulty. Likewise, acquiring more items seems irrational, especially if shared finances were used to buy these items. Clutter may be a cause or consequence of low social support, but difficulty discarding and excessive acquisition may be more so the cause of low social support, driving away people who care. Thus, these symptoms may be highly related as constructs. Admittedly, distinctions
between hoarding symptoms may emerge in a clinical sample, where clutter or other symptoms may be at a level severe enough to interfere with social functioning.

In this study, the three SI-R subscales may not accurately reflect the distinctions between the three corresponding constructs due to the high intercorrelations. The high intercorrelations between subscales within the SI-R were unexpected, which rendered the subscales as functionally indistinguishable constructs. The intercorrelations between the SI-R subscales in the current sample ranged between rs = .71 to .79, compared to an undergraduate students sample that ranged between rs = .67 to .73 (Raines, Oglesby, Unruh, Capron, & Schmidt, 2014a), and a previous hoarding sample that ranged between rs = .31 to .56 (Frost et al., 2004). The similar correlations between the current sample and the undergraduate sample in Raines et al. (2014a) aligns with the fact that the current sample is a community sample. Different hoarding symptoms may relate to each other differently, depending on whether the sample is clinical or non-clinical. The higher intercorrelations in non-clinical samples might suggest that specific hoarding symptoms may not differentiate between each other meaningfully, compared to clinical samples. Hoarding symptoms may correlate at low levels in a clinical sample—even individuals with clinical levels of hoarding may not report high levels of every symptom. For example, people with a large house or an abundance of storage space may have limited evidence of problematic clutter, even if they have extreme difficulty with discarding and acquisition.

Intriguingly, clutter symptoms measured by different scales showed slightly different relationships: Saving Inventory-Revised clutter was related to perceived support and social conflict, whereas Clutter Image Rating clutter was marginally related to perceived support and was related to social conflict. The CIR was included in the study as a convergent measure of the SI-R Clutter subscale. Especially when insight is a substantial problem in hoarding, the CIR,

which has a high interobserver reliability, is a useful tool. Correlations found between the SI-R Clutter scale and the CIR (including both experimenter and client ratings) ranged from rs = .57 to .63 in the study that developed the CIR (Frost et al., 2007), which is comparable to the correlation in the current study, r = .69. The comparable correlations suggest that the CIR might be a good supportive measure for the SI-R. However, the small difference in effects between the two measures suggests that the brief three-item CIR may be less sensitive than the SI-R Clutter.

An advantage of the CIR is that it can provide a more objective response of the extent of clutter. In the CIR, the respondent merely compares the images provided with the memory of their own home and finds a match, which leaves less room for justification and social desirability. In the SI-R, the respondents might consider an item such as "how much of your home does clutter prevent you from using?" and rationalize that they would not frequently use that cluttered area of their home anyway, and provide a lower rating, thus increasing subjectivity. A disadvantage of the CIR is that a pictorial scale may be too one-dimensional to fully determine an individual's symptom of clutter. The CIR solely rates the volume of clutter, whereas the SI-R Clutter subscale inquires not only about the volume of clutter, but also important aspects specifically related to clutter such as interference with function, distress, intended use of home areas, perceived controllability of clutter, and visitors. Individuals may objectively know how much clutter is in their home reflected by the CIR, which does not affect how much support they perceive to be available; however, thinking of other stressful (more subjective) aspects of clutter reflected in the SI-R and how these aspects interfere with the individuals' lives, may distort perceived support. Thus, the two scales measure similar but not identical constructs of clutter. Researchers and clinicians may be encouraged to use the CIR more frequently with other convergent measures, or develop a more comprehensive measure for hoarding.

Role of Depression in Predicting Social Support

Researchers have studied the relationship between psychopathology and social support for many decades, and researchers continue to be interested in exploring the nuances in different types of psychopathology and social support. The association between depression and social support has been one of the most robust findings. Depression has a high lifetime prevalence of 16.2%, 72.1% of these depression cases have comorbid psychological disorders, and depression is rarely the primary diagnosis (Kessler et al., 2003). Given these data, it is surprising that even recent studies do not consistently account for depression when examining relationships between psychopathology and social support (Medard & Kellett, 2013; Morton, White, & Young, 2014).

Individuals with hoarding problems are unlikely to seek help from others regardless of how severe their symptoms are. Previously, individuals who hoard were found to have less social support than student and community controls, but the crucial role of comorbid depression has been neglected (Medard & Kellett, 2013). The current study similarly found that hoarding, like most psychopathology, is associated with some aspects of social support. However, a more complete picture of the phenomenon of interest is demonstrated: hoarding is indeed related to social support, but depression is clearly responsible for the relationship. In rare cases where individuals have hoarding problems without comorbid conditions, problems with insight and slow progress still persist. In common cases where depression is also present, the more severe or chronic depression is, the less interest, energy, and motivation individuals have in tackling their hoarding problem. Thus, the high comorbidity of depression complicates the phenomenon of hoarding.

In the full sample of this study, the interaction between depression and clutter symptoms predicted perceived support. Analyses were repeated on participants who took longer to

complete the survey, because these participants were more likely to have considered their responses thoughtfully. In this subsample, interactions were found in the other two hoarding symptoms but not for clutter: difficulty discarding interacted with depression for perceived support, and acquisition interacted with depression for social conflict. These interactions suggest that depression may moderate certain aspects of hoarding for perceived support and social conflict, but the small effects and inconsistencies constrain the interpretation of these findings.

The discrepancies and inconsistent interactions in the current study suggest that depression and specific hoarding symptoms may influence each other in their relationship with perceived support and social conflict, but how they do so is unclear. People who are severely depressed tend to perceive that they lack available support, regardless of the amount of clutter they have, but people who are less depressed perceive a lack of available support only if they have high levels of clutter. This interaction is consistent with the expectation that high levels of psychological problems are associated with lower levels of perceived support, regardless of whether the problem is depression or clutter. However, clutter severity by itself does not meet diagnostic criteria for hoarding. Mobility issues or physical limitations, executive function difficulties that interfere with daily function and self-sufficiency, and psychological problems that may alter motivation can all contribute to clutter. More broadly, any state or condition that might make housekeeping less essential or more difficult may lead to clutter accumulation. Depression is the most relevant for this study, due to its comorbidity with hoarding. Lack of energy and motivation may contribute to the amount of clutter an individual might have in their home. Clutter by itself is not sufficient to provide conclusions specific to hoarding because many other conditions may lead to clutter. Thus, this interaction alone may be unable to provide insight specific to hoarding. The other interactions found in the subsample of participants who

completed the survey in over 20 minutes are more puzzling. The inconsistent pattern of interactions and the small effects of all three interactions may hint that different symptoms of hoarding may interact with depression, but these varying interactions may be more likely found by chance. Future studies using clinical samples may help clarify the role of depression on hoarding.

Limitations

The current study explored several facets of social support, used established scales for each facet, and most importantly, controlled for depression in which previous studies have not, which takes into account that hoarding frequently occurs in the context of depression. However, limitations include the characteristics of the current study's sample, the nature of (online) selfreport data, assessment of hoarding, and absence of some data in the Saving Inventory-Revised measure. No inferences can be made about causal relationships among the variables measured due to the cross-sectional nature of this study.

Sample characteristics. Recruitment procedures in this study aimed to target participants with a spectrum of hoarding problems. The current sample had 29% of participants who may have clinical levels of hoarding problems. Although the obtained data had a wide range of hoarding symptoms, the subscales within the SI-R were surprisingly highly correlated, as discussed previously. Further, DASS depression was not highly correlated with hoarding symptoms (r = .30) in the current study, despite the high co-morbidity between depression and hoarding in the literature (Frost et al., 2011). Of the studies found, the correlation between the SI-R and the DASS (whole scale) was r = .34 in a hoarding sample (Raines, Timpano, & Schmidt, 2014b), and the correlation between SI-R and the Hospital Anxiety and Depression Scale was r = .50 in an elderly hoarding sample (Ayers et al., 2013). Explanations are difficult to

draw without another community sample to compare with; however, given that the current study is a community sample, the lower correlation is less surprising. This may also suggest that depression is associated with problematic levels of hoarding, but not with the entire range of hoarding symptoms, potentially indicating that dealing with mild levels of hoarding does not trigger depression or that low depression does not affect hoarding substantially.

Additionally, many participants of this study live in small homes, which may amplify clutter symptoms. The majority of the full sample (87%, n = 68) and the majority of the hoarding subsample (87%, n = 20) live in a home with six or fewer rooms, which is likely to be a 1-2 small bedroom apartment. The smaller a home, the more easily clutter accumulates. For individuals who live in more spacious homes, the severity of accumulated clutter may not be as apparent even if the individual has extreme difficulty discarding and excessive acquisition. Current measures of hoarding do not fully take this factor into consideration, but ensuring a wider range of home sizes among participants may have better considered this relationship between home size and clutter.

Assessment of hoarding. The SI-R was designed to assess hoarding symptoms in a clinical population, but has also been widely used in community samples for research purposes. The high SI-R intercorrelations found in the current study raise questions about whether these scales are consistently applicable across samples other than clinical samples. The presence of hoarding symptoms may manifest differently for clinical versus non-clinical samples, and the same item might elicit very different ratings depending on the respondent. For example, for an item that inquires about clutter volume, someone who does not hoard might rate three waist-high stacks of newspapers in a room to be a large amount of clutter, whereas someone who hoards (or has a family member who hoards) might rate the same three stacks of newspapers to be a small

amount of clutter. Hoarding studies, including studies that developed hoarding measures, have arbitrarily used a dimensional or categorical operationalization of hoarding without empirical basis (Timpano et al., 2013). Therefore, as a relatively new disorder, the assessment tools used for hoarding still need to be refined.

Self-report. One major limitation of the study is the exclusive reliance on self-report. This commonly used method may bias results through social desirability, lack of effort, or lack of insight. However, self-report data are valuable in accessing individuals' perceptions of themselves and their social world that is otherwise unobtainable. In this study, established and widely used measures with good psychometric properties were carefully selected. The limitations of self-report measures do not weaken their importance, but rather denotes that further research should use multiple methods to increase validity to hoarding research on the topic as a whole, in this case, social support, by combining questionnaires, interviews, and observational approaches.

The problem of insight is most important to address in a study about hoarding. Previously, family and friend informants have described individuals who hoard on average as having fair to poor insight. Informant ratings of the individuals' hoarding severity tend to be significantly higher than the individuals' rating of their own hoarding severity (Tolin, Fitch, Frost, & Steketee, 2008a). Only two known studies have directly observed home conditions in an older community sample, examining hazards of hoarding, poor hygiene, unsanitary conditions, and housing and utilities in need of repairs. Dong, Simon, Mosqueda, and Evans (2012b) identified that self-neglect and personal and environmental hazards are prevalent in the aging population of a particular urban community, and Dong, Simon, and Evans (2012a) found that the prevalence was higher among those with lower levels of education and incomes. This highlights the important findings that can be found using multiple methods.

Researchers are aware of the problem of insight and have begun to address these problems. The CIR was developed in an attempt to deal with under and over-reporting of hoarding symptoms, and as previously mentioned, client and experimenter-rated CIR ratings tend to be highly correlated. In the current study, the CIR was correlated r = .69 with the SI-R Clutter subscale, which was comparable, if not higher than previously found correlations of rs = .57 and .63 (Frost et al., 2007). Therefore, as a measure that was developed to accurately and objectively assess clutter regardless of insight, using the CIR as a secondary supportive measure of hoarding symptoms may be a step towards dealing with the problem of poor insight in hoarding assessments, even if it only measures the clutter aspect.

Online surveys. In the current study, participants who seemed to have completed the survey too quickly to have read the items carefully were excluded from data analyses. As online surveys are more frequently used, more validity checks beyond a duration check should be put in place, such as questions that ensure participants are paying adequate attention to the items. As online surveys are increasingly used in research, many studies have been done to ensure their validity against pencil and paper surveys. Online survey results are consistently comparable, if not better. Research examining highly sensitive information tend to elicit less social desirability bias on web-based surveys compared to pencil and paper surveys (e.g., Booth-Kewley, Larson, & Miyoshi, 2007; Couper, 2000; Tourangeau, Couper, & Steiger, 2003), an online survey format may add to participants' anonymity and may actually yield lower non-response rates on sensitive questions (Kays, Gathercoal, & Buhrow, 2011), in addition to eliciting more genuine emotions and less inhibition (Hanna, Weinberg, Dant, & Berger, 2005; Huang, 2006; Joinson, 1999).

Missing data. The treatment of missing data was carefully considered (i.e., advantages and disadvantages of using a shortened version of the SI-R versus multiple imputation to fill in

missing data were compared), prior to the decision to use the shortened version for analyses and extrapolated scores to compare with SI-R means in the literature. The results between using multiple imputation and the 16-item SI-R demonstrated the same pattern of findings; nonetheless, valuable data were still unavailable due to missing items, and the psychometric properties of the 16-item SI-R could not be evaluated. Additionally, comparisons of correlations with other studies were still possible, but the current study would conceivably have a lower upper-limit SI-R score due to missing items.

Implications and Conclusions

This study provides a basis for further research on social interactions in hoarding. Surprisingly, hoarding symptoms were not uniquely related to social support variables. The relationship between hoarding symptoms and some aspects of social support is largely due to depression. This inevitably prompts the question of why depression accounts for this relationship, which highlights the importance of examining the effects of depression in all future hoarding research. Further, there is a potential need for interventions to target depression in conjunction with hoarding, rather than treating them separately, which appears to be the most common practice in group CBT for hoarding. Nevertheless, these findings demonstrate the necessity in building sensitivity and awareness beyond media portrayals of hoarding. Through better understanding, adequate services can be provided, and family and friends are empowered to offer better support with minimal conflict.

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