


Future research directions in children and hoarding

Andrew G. Guzick , Sophie C. Schneider and Eric A. Storch

Baylor College of Medicine, Houston, TX 77030-3411, USA

Article

Cite this article: Guzick AG, Schneider SC, and Storch EA (2020). Future research directions in children and hoarding. *Children Australia* 45: 175–181. <https://doi.org/10.1017/cha.2020.13>

Received: 15 March 2020
Revised: 11 April 2020
Accepted: 13 April 2020
First published online: 3 June 2020

Keywords:

Hoarding disorder; youth; adolescents; early intervention; family interventions

Author for correspondence:

Andrew G. Guzick,
Email: Andrew.guzick@bcm.edu

Abstract

Despite a rapidly growing understanding of hoarding disorder (HD), there has been relatively limited systematic research into the impact of hoarding on children and adolescents. The goal of this paper is to suggest future research directions, both for children with hoarding behaviours and children living in a cluttered home. Key areas reviewed in this paper include (1) the need for prospective studies of children with hoarding behaviours and those who grow up with a parent with HD; (2) downward extensions of cognitive-behavioural models of adult HD that emphasise different information processing and behavioural biases in youth HD; (3) developmental research into the presentation of emerging HD in childhood compared with adulthood presentations of the disorder, with consideration of typical childhood development and unique motivators for childhood saving behaviours; (4) developmentally sensitive screening and assessment; and (5) the development of evidence-based treatments for this population. The paper concludes with a discussion of methodological suggestions to meet these aims.

Background: Rationale for studying children and hoarding

Over the past two to three decades, there has been an acceleration of research and clinical interest in hoarding disorder (HD). Once considered a subtype of obsessive-compulsive disorder (OCD), HD is now recognised as a distinct disorder based on its unique clinical features, genetic independence from OCD and poorer response to OCD-focused treatment (Mataix-Cols et al., 2010). This recognition led to the introduction of HD as an independent diagnosis in DSM-5 and ICD-11, which has prompted even more systematic research in this population in recent years (Mataix-Cols et al., 2010). Despite significant advances in the biopsychosocial understanding of HD in adults, our understanding of children and hoarding has lagged far behind. This is likely because it is rare for families to present to clinical settings with a primary concern for childhood hoarding problems. In adults, HD has been found to take a progressive course, and the accumulation of an impairing or dangerous level of clutter, or with clinically significant discarding difficulties, often takes years (Landau et al., 2011; Tolin et al., 2010). Children, on the other hand, typically do not have the time, space, financial resources or environmental control for hoarding-related problems to affect their day-to-day functioning and thus have largely been underrepresented in hoarding research.

So why study hoarding in children and adolescents? Existing research points to a number of reasons:

Among adults with HD, hoarding behaviours often begin in childhood or adolescence. One recent meta-analysis identified 16.7 years old as the mean age of onset for adults with HD based on retrospective recall in adult studies (Zaboski et al., 2019). A number of studies suggest a bimodal age of onset, with some individuals describing clinically significant hoarding beginning in later adulthood (around the 30s), but many others citing difficulty discarding beginning in childhood (Landau et al., 2011; Tolin et al., 2010). It is worth noting that although the development of HD in adulthood is often associated with traumatic events, childhood onset of hoarding has been less strongly linked with trauma (Landau et al., 2011).

Hoarding behaviours are prevalent in childhood in both clinical and nonclinical populations. Studies on the course of compulsive behaviours across child development have found that repetitive behaviours, including collecting, are developmentally typical, generally peaking during childhood and pre-adolescence and declining through adolescence (Evans et al., 2017). For example, one survey found that 70% of 6-year-old children had a collection of some kind (Evans et al., 1997). A more recent large community study of children aged 6–17 years old found elevated hoarding symptoms in almost 9% of the sample (Burton et al., 2016).

Clinically significant hoarding, however, has predominantly been studied in the context of other primary childhood disorders, including attention-deficit/hyperactivity disorder (ADHD, e.g., Hacker et al., 2016), OCD (e.g., Højgaard et al., 2019), Prader-Willi syndrome (e.g., Dykens et al., 1996) and autism spectrum disorder (e.g., La Buissonniere-Ariza et al., 2018; Scahill et al., 2014), with a relatively high prevalence of hoarding problems identified in all these populations. Hoarding behaviour has been identified in approximately 25–30% of youth with primary

diagnoses of OCD (Højgaard et al., 2019; Samuels et al., 2014) and ASD (La Buissonniere-Ariza et al., 2018; Scahill et al., 2014), with clinically significant hoarding estimated in approximately 7% of youth with ASD (La Buissonniere-Ariza et al., 2018). In youth with Prader-Willi syndrome, a genetic syndrome characterised by early hypotonia, intellectual impairment, growth hormone abnormalities, and hyperphasia and obesity, hoarding behaviour has been observed in 47% of youth (Dykens et al., 1996). Although HD is characterised as an OCD, studies have shown stronger associations between hoarding and ADHD than hoarding and OCD in both community and clinical samples (Burton et al., 2016; Hacker et al., 2016). Accordingly, clinical hoarding was found to occur in 30% of youth with ADHD in a survey of 99 participants, with inattention symptoms significantly predicting difficulty discarding, clutter, and overall severity, and hyperactivity/impulsivity predicting acquisition and hoarding-related distress (Hacker et al., 2016). This is particularly relevant when considering the study of childhood hoarding, as ADHD is more commonly identified and treated in childhood compared with adulthood.

Hoarding is associated with considerable individual, interpersonal and societal impact, and is a prognostic indicator of poor psychiatric outcomes (Burton et al., 2015; Frost et al., 2000). Further, in studies of hoarding in other primary childhood disorders, hoarding is often associated with more severe presentations of the primary disorder (Hacker et al., 2016; Højgaard et al., 2019; La Buissonniere-Ariza et al., 2018; Samuels et al., 2014), indicating that it may be a marker of more severe overall psychopathology. Thus, it is imperative to direct efforts towards early intervention and prevention of this problem. When considering how frequently HD is reported to begin in childhood, along with the prevalence of hoarding in other common childhood disorders, there appears to be a clear window for early intervention that may prevent negative long-term outcomes associated with this disorder.

Studies of the interpersonal functioning of adults with HD, along with adult children who grew up in a hoarded home, indicate high levels of family conflict and distress in children with parents with HD (Guzick et al., *under review*; Park et al., 2014; Tolin et al., 2008), though no research has specifically studied children currently living in a hoarded home.

Regardless, very limited research has investigated children and hoarding, and much less is known about hoarding in childhood compared with HD in adulthood. The goal of this paper is to discuss potential future directions in research on hoarding and children, including pursuing a better understanding of the long-term course of children with hoarding behaviours or living in a hoarded home, the core deficits associated with hoarding in childhood, and developing effective assessment and treatment approaches for this population.

Future directions

Prospective studies of the trajectory of hoarding across time

Only one study to date has prospectively investigated adolescents who screened positive for hoarding longitudinally (Ivanov et al., 2019). In a Swedish twin study of 42 participants who initially screened for elevated HD symptoms at 15 years old compared with their twin and community control, participants with hoarding symptoms were significantly more likely to endorse all hoarding symptoms at 1–6-year follow-up (median follow-up length was 3 years), as well as greater overall hoarding symptoms and familial impact (Ivanov et al., 2019). Because this was still a young group,

none of the participants met the full criteria for HD, however, primarily due to a failure to meet the clutter criterion (Ivanov et al., 2019). This finding underscores how difficult this research will be, as even among youth who screen positive for hoarding symptoms, it is unlikely that they will reach an impairing level for years or even decades, though they were shown to maintain symptoms across time without intervention. It also calls into question the appropriateness of DSM-5 and ICD-11 HD criteria for children and adolescents, as young people may experience a strong need to save possessions regardless of value (American Psychiatric Association [APA], 2013), the central feature of HD, but may have not accumulated an impactful level of clutter, a diagnostic requirement based on the current definitions of HD.

Future research may also target populations who are known to engage in hoarding behaviours, such as youth with ADHD, to investigate whether hoarding associated with these other disorders leads to later adult presentations of HD. It may be that hoarding in childhood ADHD may result from disorganisation rather than excessive attachment to objects or difficulty discarding. At the same time, however, adult HD and ADHD are associated with significant executive dysfunction (Ayers et al., 2016; Lynch et al., 2015), and it may be that the cognitive vulnerabilities associated with childhood ADHD are a risk factor for later development of HD. Incorporating assessment of features related to hoarding that fall outside the strict diagnostic criteria will likely be important to improve early identification of risk for HD (e.g., information processing biases, neuropsychological deficits, motivation for hoarding, as described further below).

Prospective studies of children with hoarding parents

In addition to studying children with hoarding behaviours, one area that warrants further research concerns children who live in a cluttered home. Multiple retrospective reports have described high levels of stress, social impairment and feelings of rejection towards parents in this group (Guzick et al., *under review*; Park et al., 2014; Tolin et al., 2008). In fact, feelings of rejection towards family members with hoarding behaviours has been reported to be higher than that of family members of individuals with schizophrenia or OCD (Tolin et al., 2008). Further, over half of adults in a recent survey described clinically significant generalised anxiety and depressive symptoms during childhood and adolescence when living with a parent with elevated HD symptoms (Guzick et al., *under review*). This research has consistently pointed to significant relationships between parental hoarding severity and parent-child conflict (Guzick et al., *under review*; Park et al., 2014; Tolin et al., 2008).

This is unsurprising when considering a wide body of research that has identified adverse childhood experiences, including neglect and maltreatment, as a prominent risk factor for psychopathology (Chapman et al., 2004; Sareen et al., 2013). Although a wide literature now exists on adverse childhood experiences, this literature typically assesses childhood adversities including physical abuse, sexual abuse, neglect and significant family dysfunction (Chapman et al., 2004; Sareen et al., 2013), and has not specifically investigated the physical condition of the home children lived in. Children who live with parents with HD may not have a bed to sleep in, access to adequate nutrition, and could be at-risk for significant safety hazards related to hygiene, sanitation or fire safety (Chabaud, 2011; Frost et al., 2000). They may also be ashamed of their living condition and have more difficulty developing peer relationships due to the condition of their home (Tolin et al.,

2008). All of these experiences are conceivably linked to mental health concerns such as anxiety, depression, isolation or posttraumatic stress symptoms, though have not been prospectively studied to date.

In addition to the environmental stress caused by having a parent with HD, children of parents with HD are also highly vulnerable for hoarding problems themselves. Adults with HD are significantly more likely to have grown up in a cluttered home and to have relatives with hoarding symptoms compared with adults with OCD or healthy controls, with 37% of individuals with HD reporting that they had grown up in a cluttered home in one study (Steketee et al., 2015). Twin studies have estimated that genetics explain approximately 25–51% of the variance in hoarding symptoms (Lopez-Sola et al., 2014; Mathews, et al., 2014; Mozani et al., 2014). Because HD has a clear genetic influence, studying this population across time could also help identify environmental or psychosocial risk factors for developing hoarding behaviours as adults.

This research has underscored that children with parents with HD are a highly vulnerable group in terms of both genetic and environmental risk, yet to date, there have been no studies that have specifically studied children currently living in a cluttered home. Understanding stress responses, accommodation, impairment, and emotional and behaviours problems in this population can help identify key areas for intervention and outreach research.

Downward adaptations of adult HD models

The adult literature on the clinical characteristics of HD has the potential to guide initial research into similar constructs in children, while also considering potential developmental differences. These likely include issues around clutter and excessive acquisition, information processing biases, differences in motivators for saving and phenomenological differences in childhood hoarding in the context of other primary disorders.

Clutter and excessive acquisition

When considering how typical it is for parents to complain about their children's messy rooms, it is unlikely that excessive clutter could be a highly specific risk factor for HD in childhood. Excessive clutter may exist for a number of reasons, including an aversion to tidying up, disorganisation and executive dysfunction, or may reflect broader issues with oppositional behaviour or depressive symptoms. As is the case in adults, difficulty discarding and related cognitive features are more central to the diagnosis of HD rather than clutter. Thus, clutter is likely a necessary, but not sufficient, element of childhood hoarding, and studies of childhood hoarding should de-emphasise clutter or continue focusing on clutter in children's rooms only (Storch, Muroff et al., 2011).

Excessive acquisition occurs in most adults with HD, particularly those with an earlier age of onset (Frost et al., 2013). Thus, it may be that children with hoarding are likely to also show a tendency towards excessive acquisition, though at the same time, excessive acquisition may be less likely to occur in children and adolescents due to their typically limited spending capacity. It may be informative to study whether differences in excessive acquisition can be identified in children with hoarding behaviours, and whether this stands as a risk factor for later HD in adulthood. For example, research may investigate whether children who are more likely to seek out objects considered useless by others (e.g., taking their friends' old things, bringing home supplies from

school that would otherwise be thrown out) are more likely to later have HD.

Information processing biases

Central to cognitive-behavioural models of adult HD are information processing and cognitive biases (Frost & Hartl, 1996). Several cognitive biases have been consistently identified in adults with HD compared with individuals without HD, most prominently including performance-based assessments of categorisation difficulties and indecisiveness (Grisham et al., 2010; Tolin et al., 2012). Further, certain neuropsychological deficits have been consistently observed in adult HD, including in executive functioning, visuospatial reasoning and general problem-solving abilities (Woody et al., 2014). These same deficits have yet to be examined in children and adolescents with hoarding; however, parent-reported indecision and ADHD symptoms, which are often associated with executive dysfunction, have been observed in children with hoarding problems (Burton et al., 2016; Hacker et al., 2016; Samuels et al., 2014).

Motivators of hoarding

Another critical aspect of HD that has not been investigated in children and adolescents with hoarding includes motivators of hoarding. In adults, sentimental attachment, beliefs about the usefulness of objects for the future, fears of losing important information and the aesthetic appeal of objects are all commonly endorsed, with sentimental attachment being the most commonly endorsed motivator (Dozier & Ayers, 2014; Gordon et al., 2013). Children may also have difficulty discarding when asked, or have an accumulation of clutter, due to an aversion to unpleasant activities like tidying their room, rather than due to motivators identified in adult hoarding (e.g., sentimental attachment, fears of needing items in the future). This may be particularly true in children with ADHD, who have been identified as particularly likely to have hoarding behaviours. Better assessment of the motivation behind difficulty discarding or clutter problems (e.g., are they relate to oppositional behaviour versus a more HD-specific motivator like sentimental attachment) will help identify children that should be included in childhood studies of HD behaviour.

Comorbidity-specific differences

Across studies of childhood hoarding in other primary diagnoses (e.g., ADHD, ASD, Prader–Willi syndrome), hoarding behaviours appear to be distinct from typical HD in adulthood. This may reflect disorder-specific differences in hoarding presentation, or alternatively, may reflect differences in hoarding behaviour based on a child's developmental stage. For example, in Prader–Willi syndrome, excessive food-related hoarding has been noted, which may be tied to the very large appetite observed in this group (Dykens et al., 1996). Clinical observation suggests that hoarding in childhood ADHD more often has to do with disorganisation and executive dysfunction, rather than a strong sentimental attachment to objects, as is found in adults (Storch, Rahman et al., 2011). As noted, in ASD, hoarding is often related to hyper-focused interests, rather than sentimental attachment to objects more broadly (La Buissonniere-Ariza et al., 2018). In fact hoarding has also been found to be more common in children with high-functioning autism spectrum disorder than OCD, due to collections related to hyper-focused interests, with extreme distress at the thought of them being taken away (Ruta et al., 2010).

Modifications to diagnostic criteria for children

As noted, using strict DSM-5 or ICD-11 criteria to study HD in childhood may not be an appropriate approach. Existing criteria do emphasise ruling out excessive collecting due to other medical or psychological conditions that can better explain the behaviour (specifically food-related hoarding in Prader–Willi syndrome and collecting related to interests in ASD; APA, 2013), though further modifications should be considered to better guide research and clinical services directed at this population. To begin, removing or modifying the clutter criterion to limit clutter to a child's room or personal space appears to be one difference already adapted in childhood HD research (Storch, Muroff et al., 2011).

Summary

It would be valuable to investigate when characteristics associated with adult HD emerge in children with hoarding behaviours, and perhaps more importantly, if they are associated with worsening hoarding behaviours in adulthood. Cross-sectional studies comparing children with and without hoarding problems, or alternatively, studying the relationship of these variables with hoarding severity dimensionally, may identify if these biases similarly distinguish children with hoarding problems and those without. Prospective studies investigating whether indecisiveness, categorisation difficulties, problem-solving deficits or sentimental attachment to objects during childhood or adolescence predict the later onset of clinically significant hoarding problems may also prove informative. Alternatively, many of the differences that have been observed in childhood hoarding populations may reflect non-HD underlying problems (e.g., food-related hoarding in Prader–Willi syndrome or ADHD; collecting objects related to intense interests in ASD). Future studies of the presentation of hoarding behaviour among children with and without other primary presenting problems may help better characterise childhood hoarding. Following up this research with longitudinal studies, or cross-sectional studies of individuals with these diagnoses across different age groups, may provide a more developmentally sensitive analysis of whether certain hoarding behaviours in childhood do or do not correspond with the development of later, traditional, impairing adulthood HD presentations. This research would likely clarify how to adapt DSM and ICD criteria to children and adolescents. Adjusting the clutter criterion appears to be a clear first step, though continuing to pursue research on developmental differences may clarify what other modifications may be necessary for children and adolescents.

Developmentally sensitive screening and assessment

To effectively answer these questions, further advancement of developmentally sensitive assessments of children and hoarding will be necessary, including both children with hoarding behaviours and children who may be living in a cluttered home.

Children with hoarding behaviours

To date, there has been one validated assessment of hoarding behaviours in childhood, the Children's Saving Inventory (CSI) (Storch, Muroff et al., 2011). The CSI is a 20-item Likert-scale self-report measure adapted from the adult Saving Inventory-Revised (Frost et al., 2004), with four factors composing difficulty discarding, clutter, excessive acquisition, and distress and impairment based on its validation in children with OCD (Storch, Muroff et al., 2011).

As described earlier, collecting and sentimental attachment to objects is a common part of childhood, and distinguishing emerging hoarding problems may be particularly difficult in this age range. Part of the instrument development will need to identify cut scores and potential items that differentiate developmentally typical collecting versus clinically significant hoarding. For example, research that has used the CSI in children with autism has generally relied on average scores of at least 2 ('moderate') on items, derived from the adult measure (Frost & Hristova, 2011), to determine clinical hoarding (e.g., La Buissonniere-Ariza et al., 2018). Further psychometric analyses may identify items that are likely to flag children (e.g., those about difficulty discarding vs. those about acquisition or clutter), which may help clinicians know what critical screening questions to ask during a comprehensive diagnostic assessment. Reliably understanding what scores, or what screening questions, identify children with clinically significant hoarding would be aided by developmentally sensitive diagnostic interviews for childhood HD which have not been developed to date.

Across these assessments, developmental considerations should continue to be considered. For example, in the CSI, clutter in children's rooms is specified compared with the adult version, which assesses clutter more broadly in the home (Storch, Muroff et al., 2011). An emphasis on difficulty discarding (particularly focusing on emotional consequences for discarding), is likely central to the assessment of hoarding in children and adolescents and should continue to be a focus in research in hoarding behaviours in children and adolescents.

An additional modification to assessing hoarding in children and adolescents may include more thorough consideration of motivators for saving. As noted, sentimental attachment, beliefs that an item may be useful one day, concern about waste and aesthetic value have all been identified as motivators for hoarding behaviour in adults with HD. Another prominent reason for clutter or difficulty discarding in children may be an aversion for any non-preferred or 'boring' activities like cleaning up. This aversion would be expected to be especially pronounced in childhood populations identified to have hoarding behaviours, including ADHD and ASD (Malkovsky et al., 2012), and thus it may be useful to include this additional motivator in the assessment of childhood hoarding. If children do not have a strong emotional reaction to parents cleaning up their messy rooms, clutter difficulties are unlikely tied to diagnostic hoarding problems as they are currently defined. Alternatively, children who have strong emotional reactions when they or a parent are discarding their items and cite sentimental attachments to their objects, or significant concerns for needing items one day, would be more likely to have emerging HD. Thus, more specific assessment of hoarding cognitions may be an important next step in childhood hoarding research. This may be a valuable addition in future work to better parse out differential diagnoses, particularly in studies that rely on self-report data and may classify children with clutter and difficulty discarding due to an aversion to cleanup as having clinical HD symptoms.

Children of parents with HD

Better assessment and screening of clutter and unsafe home environments would be important for both research and clinical settings. As noted, a wide literature now exists on the negative psychosocial impact of adverse childhood experiences and developmental trauma, though assessment of the home environment has largely been ignored in this research. This literature typically uses large lists of traumatic experiences that are common in

childhood to assess these constructs, including psychological abuse and items relevant to household dysfunction (e.g., parental substance use, mental illness, violent conflict, e.g., Felitti et al., 2019). Including one or two items on the physical home environment in future work of this nature may help us better understand the long-term impact of growing up in a cluttered home.

When considering the high rates of generalised anxiety and depressive symptoms in adolescents living with parents with hoarding problems in particular, it is particularly critical to develop assessments of the home condition to be used in clinical settings serving children and adolescents (Guzick et al., *under review*). While there are many widely used assessments of childhood trauma that include comprehensive lists of traumatic experiences that are frequently implemented in child mental health settings, the physical condition of the home environment has not been included in any of these measures to our knowledge. Another assessment that could be used for screening children living in a cluttered could be the Clutter Image Rating (Frost et al., 2008), an image-based assessments of home clutter, which could conceivably be filled out quickly and accurately even by young children with limited language skills.

Early intervention

Children with hoarding

As noted, children rarely present to clinical setting with a primary concern of HD, and thus there have been no systematic treatment studies for children with hoarding behaviours specifically. Regardless, early intervention has the potential to mitigate hoarding-related problems before they become entrenched (Chabaud, 2014). Targeting children who are known to be at-risk for developing hoarding problems may be one place to start providing early intervention services, such as children of parents with HD, as well as children who present with other primary concerns such as ADHD or ASD.

Because children's hoarding problems are rarely the central focus on clinical attention for any of these problems, treatment for children with hoarding problems or who are at-risk for hoarding may involve briefer cognitive-behavioural modules that can be used in conjunction with therapy addressing issues related to ADHD, OCD or ASD, or alongside parental HD treatment. This would fall in line with a broader push in the child psychotherapy literature towards transdiagnostic and/or modular therapy approaches (e.g., Weisz et al., 2012). Further, it may be that brief therapy could be particularly suited for these populations as patterns of saving would not be as long-standing in youth.

Similar to initial treatment development for many other childhood psychological problems, this treatment would likely follow a downward extension of adult cognitive-behavioural therapy protocols, or sideways extensions and adaptations of pediatric OCD treatments, which have been shown to be effective in case studies (McKay, 2016; Storch, Rahman et al., 2011). Further evidence for adapting childhood OCD treatment comes from studies that have shown that children with OCD and hoarding symptoms have not shown different treatment responses to traditional OCD treatment (Højgaard et al., 2019; Rozenman et al., 2019). Because many children may resist sorting tasks, incorporating elements of parent management training into the treatment of childhood hoarding would likely be an important component of treatment.

Children of parents with HD

Despite the high genetic and environmental vulnerabilities of growing up in a hoarded home, there have been no systematic

efforts to test treatment models for this population, which may have the potential to offset otherwise negative developmental trajectories. Incorporating aspects of evidence-based therapy for children and adolescents with generalised anxiety, depressive symptoms and posttraumatic stress symptoms more broadly may be important for these youth, while simultaneously addressing unique stressors associated with living in a cluttered home (Chabaud, 2011; *under review*). These stressors may include social isolation, safety fears associated with living in a hoarded home, hygiene and health-related issues, as well as strained relationships with parents.

Fostering collaborations between mental health, social work, community scientists and activists may be particularly important for developing intervention models for this vulnerable group. In addition to individual or group therapy, children with parents with HD would likely benefit from social services that optimise their safety and security (Chabaud, 2020). While this may involve temporary placement in a new home in cases with true safety concerns, ideally with trusted adults they already know, the goal of reunification and treatment for parents with HD should always be at the forefront as well (Chabaud, 2020).

Conclusions

Despite the high burden of HD in adults and the growing literature on this disorder, research on children and hoarding is very limited. This literature has left two groups understudied: both children with hoarding behaviours, as well as children living with parents with HD. We proposed several areas of future research in this paper, including (1) prospective studies of children with parents with HD and children at risk for developing HD in later life; (2) pursuing quantitative research on differences and similarities in clinical characteristics between youth with hoarding problems and adults (e.g., motivators for saving, clutter in childhood hoarding, information processing biases); (3) development of accurate assessment of childhood hoarding problems and screening for children exposed to dangerously cluttered home environments; and (4) potential treatment options that would be both effective and feasible for these populations.

Pursuing these research aims may come with challenges, however, and will likely involve recruitment and methodological differences from how the HD field advanced in adults. In adults, recruiting directly for individuals with HD is likely more straightforward due to the impairment that hoarding often causes in this age group. It is conceivable that directly recruiting children with cluttered rooms would bring in many frustrated parents with children with clutter for other reasons (e.g., oppositional behaviour, ADHD, typical childhood disorganisation), rather than those with emerging HD. Recruitment efforts will likely need to be targeted to children identified as at risk, such as: (1) building on ongoing adult HD research by recruiting children of their participants, (2) screening in clinical populations likely to have hoarding problems, such as ADHD (e.g., Hacker et al., 2016) and/or (3) as continued research into hoarding behaviours in community samples using items identified to be sensitive to childhood HD. Recruiting samples from diverse sources such as these would allow researchers to begin developing and testing research questions related to: (1) information processing biases in childhood hoarding, (2) motivation for saving behaviours in childhood hoarding, (3) differences in the clinical presentation of hoarding behaviours in these different groups and across ages, as well as (4) early intervention and outreach. This research

would likely help clarify developmental modifications to DSM-5 and ICD-11 diagnostic criteria of HD, which may better inform future research into childhood HD.

The prospective studies needed to meaningfully identify risk factors for adulthood HD would likely be expensive and time-consuming, and thus it is probably most feasible to incorporate questions about childhood hoarding behaviours and the home environment in existing longitudinal studies of child development (e.g., Ivanov et al., 2019) or adverse childhood experiences. This would require bridging a gap between research that has traditionally studied childhood hoarding in clinical samples with developmental trauma research (i.e., to identify children in cluttered homes) and research into development more broadly (i.e., to identify risk factors for HD).

As is often the case in mental health research, our understanding of hoarding in children has lagged significantly behind the adult literature. The small body of existing research has shown, however, that hoarding problems often begin in childhood, and that there is a considerable psychological impact on children living in cluttered homes. This has underscored the importance of increasing research efforts towards children and hoarding, including both those with hoarding behaviours themselves as well as those affected by adult hoarding. Improving our understanding of the consequences of hoarding on childhood development, as well as childhood presentations of emerging HD, has the potential to lead to meaningful early intervention programmes that could offset the considerable long-term psychosocial and community burden of HD.

Financial and competing interests disclosure. The authors declare the following potential conflicts of interest: Dr. Storch receives research support from NIH, ReBuild Texas, Red Cross, Texas Higher Education Coordinating Board, McNair Foundation, Cullen Trust and Greater Houston Community Foundation. He is a consultant for Levo Therapeutics. He receives honorarium for training from the International OCD Foundation. Finally, he receives book royalties from Wiley, Springer, Jessica Kingsley, Lawrence Erlbaum, Oxford Press and Elsevier. Ms. Guzick and Dr. Schneider report no financial and competing interest disclosures.

Funding details. This paper was not funded.

References

- American Psychiatric Association.** (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*.
- Ayers, C. R., Dozier, M. E., Wetherell, J. L., Twamley, E. W., & Schiehsler, D. M.** (2016). Executive functioning in participants over age of 50 with hoarding disorder. *The American Journal of Geriatric Psychiatry, 24*(5), 342–349.
- Burton, C. L., Arnold, P. D., & Soreni, N.** (2015). Three reasons why studying hoarding in children and adolescents is important. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 24*(2), 128.
- Burton, C. L., Crosbie, J., Dupuis, A., Mathews, C. A., Soreni, N., Schachar, R., & Arnold, P. D.** (2016). Clinical correlates of hoarding with and without comorbid obsessive-compulsive symptoms in a community pediatric sample. *Journal of the American Academy of Child & Adolescent Psychiatry, 55*(2), 114–121.
- Chabaud, S.** (2011). The hidden lives of children of hoarders. *Psychiatric Times*. Retrieved from <https://www.psychiatrictimes.com/articles/hidden-lives-children-hoarders?pageNumber=2>
- Chabaud, S.** (2014). Benefits of early identification and intervention for hoarding. In P. F. Knerr (Ed.), *The ICD guide to collaborating with professional organizers: Forrelated professionals* (pp. 314–317). Institute for Challenging Disorganization.
- Chabaud, S.** (2020). Policy for protection for children in hoarded homes: Merging child and family care in procedures and funding to addressing hoarding disorder. *Children Australia, 45*(3), 186–192.
- Chapman, D. P., Whitfield, C. L., Felitti, V. J., Dube, S. R., Edwards, V. J., & Anda, R. F.** (2004). Adverse childhood experiences and the risk of depressive disorders in adulthood. *Journal of Affective Disorders, 82*(2), 217–225.
- Dozier, M. E., & Ayers, C. R.** (2014). The predictive value of different reasons for saving and acquiring on hoarding disorder symptoms. *Journal of Obsessive-Compulsive and Related Disorders, 3*(3), 220–227.
- Dykens, E. M., Leckman, J. F., & Cassidy, S. B.** (1996). Obsessions and compulsions in Prader-Willi syndrome. *Journal of Child Psychology and Psychiatry, 37*(8), 995–1002.
- Evans, D. W., Leckman, J. F., Carter, A., Reznick, J. S., Henshaw, D., King, R. A., & Pauls, D.** (1997). Ritual, habit, and perfectionism: The prevalence and development of compulsive-like behavior in normal young children. *Child Development, 68*(1), 58–68.
- Evans, D. W., Uljarević, M., Lusk, L. G., Loth, E., & Frazier, T.** (2017). Development of two dimensional measures of restricted and repetitive behavior in parents and children. *Journal of the American Academy of Child & Adolescent Psychiatry, 56*(1), 51–58.
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S.** (2019). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine, 56*(6), 774–786.
- Frost, R. O., & Hartl, T. L.** (1996). A cognitive-behavioral model of compulsive hoarding. *Behaviour Research and Therapy, 34*(4), 341–350.
- Frost, R. O., & Hristova, V.** (2011). Assessment of hoarding. *Journal of Clinical Psychology, 67*(5), 456–466.
- Frost, R. O., Rosenfield, E., Steketee, G., & Tolin, D. F.** (2013). An examination of excessive acquisition in hoarding disorder. *Journal of Obsessive-Compulsive and Related Disorders, 2*(3), 338–345.
- Frost, R. O., Steketee, G., & Grisham, J.** (2004). Measurement of compulsive hoarding: Saving inventory-revised. *Behaviour Research and Therapy, 42*(10), 1163–1182.
- Frost, R. O., Steketee, G., Tolin, D. F., & Renaud, S.** (2008). Development and validation of the clutter image rating. *Journal of Psychopathology and Behavioral Assessment, 30*(3), 193–203.
- Frost, R. O., Steketee, G., & Williams, L.** (2000). Hoarding: A community health problem. *Health & Social Care in the Community, 8*(4), 229–234.
- Gordon, O. M., Salkovskis, P. M., & Oldfield, V. B.** (2013). Beliefs and experiences in hoarding. *Journal of Anxiety Disorders, 27*(3), 328–339.
- Grisham, J. R., Norberg, M. M., Williams, A. D., Certoma, S. P., & Kadib, R.** (2010). Categorization and cognitive deficits in compulsive hoarding. *Behaviour Research and Therapy, 48*(9), 866–872.
- Guzick, A.G., Chabaud, S., Garrett, C., & Storch, E.A.** (under review). Growing up in clutter: Generalized anxiety, depressive symptoms, and rejecting attitudes among adult children of parents with hoarding problems.
- Hacker, L. E., Park, J. M., Timpano, K. R., Cavitt, M. A., Alvaro, J. L., Lewin, A. B., . . . Storch, E. A.** (2016). Hoarding in children with ADHD. *Journal of Attention Disorders, 20*(7), 617–626.
- Højgaard, D. R., Skarphedinsson, G., Ivarsson, T., Weidle, B., Nissen, J. B., Hybel, K. A., Torp, N. C., & Thomsen, P. H.** (2019). Hoarding in children and adolescents with obsessive-compulsive disorder: Prevalence, clinical correlates, and cognitive behavioral therapy outcome. *European Child & Adolescent Psychiatry, 28*(8), 1097–1106.
- Ivanov, V. Z., Mataix-Cols, D., Serlachius, E., Brander, G., Elmquist, A., Enander, J., & Rück, C.** (2019). The developmental origins of hoarding disorder in adolescence: A longitudinal clinical interview study following an epidemiological survey. <https://doi.org/10.31234/osf.io/ns5wf>
- La Buissonniere-Ariza, V., Wood, J. J., Kendall, P. C., McBride, N. M., Cepeda, S. L., Small, B. J., . . . Storch, E. A.** (2018). Presentation and correlates of hoarding behaviors in children with autism spectrum disorders and comorbid anxiety or obsessive-compulsive symptoms. *Journal of Autism and Developmental Disorders, 48*(12), 4167–4178.

- Landau, D., Iervolino, A. C., Pertusa, A., Santo, S., Singh, S., & Mataix-Cols, D. (2011). Stressful life events and material deprivation in hoarding disorder. *Journal of Anxiety Disorders*, 25(2), 192–202.
- López-Solà, C., Fontenelle, L. F., Alonso, P., Cuadras, D., Foley, D. L., Pantelis, C., ... Menchón, J. M. (2014). Prevalence and heritability of obsessive-compulsive spectrum and anxiety disorder symptoms: A survey of the Australian Twin Registry. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*, 165(4), 314–325.
- Lynch, F. A., McGillivray, J. A., Moulding, R., & Byrne, L. K. (2015). Hoarding in attention deficit hyperactivity disorder: Understanding the comorbidity. *Journal of Obsessive-Compulsive and Related Disorders*, 4, 37–46.
- Malkovsky, E., Merrifield, C., Goldberg, Y., & Danckert, J. (2012). Exploring the relationship between boredom and sustained attention. *Experimental Brain Research*, 221(1), 59–67.
- Mataix-Cols, D., Frost, R. O., Pertusa, A., Clark, L. A., Saxena, S., Leckman, J. F., Stein, D. J., Matsunaga, H., & Wilhelm, S. (2010). Hoarding disorder: A new diagnosis for DSM-V?. *Depression and Anxiety*, 27(6), 556–572.
- Mathews, C. A., Delucchi, K., Cath, D. C., Willemsen, G., & Boomsma, D. I. (2014). Partitioning the etiology of hoarding and obsessive-compulsive symptoms. *Psychological Medicine*, 44(13), 2867–2876.
- McKay, D. (2016). Cognitive-behavioral treatment of hoarding in youth: A case illustration. *Journal of Clinical Psychology*, 72(11), 1209–1218.
- Morris, S. H., Jaffee, S. R., Goodwin, G. P., & Franklin, M. E. (2016). Hoarding in children and adolescents: A review. *Child Psychiatry & Human Development*, 47(5), 740–750.
- Monzani, B., Rijdsdijk, F., Harris, J., & Mataix-Cols, D. (2014). The structure of genetic and environmental risk factors for dimensional representations of DSM-5 obsessive-compulsive spectrum disorders. *JAMA Psychiatry*, 71(2), 182–189.
- Park, J. M., Lewin, A. B., & Storch, E. A. (2014). Adult offspring perspectives on parental hoarding behaviors. *Psychiatry Research*, 220(1–2), 328–334.
- Rozenman, M., McGuire, J., Wu, M., Ricketts, E., Peris, T., O'Neill, J., ... Piacentini, J. (2019). Hoarding symptoms in children and adolescents with Obsessive-Compulsive Disorder: Clinical features and response to Cognitive-Behavioral Therapy. *Journal of the American Academy of Child & Adolescent Psychiatry*, 58(8), 799–805.
- Ruta, L., Mugno, D., d'Arrigo, V. G., Vitiello, B., & Mazzone, L. (2010). Obsessive-compulsive traits in children and adolescents with Asperger syndrome. *European Child & Adolescent Psychiatry*, 19(1), 17.
- Samuels, J., Grados, M. A., Riddle, M. A., Bienvenu, O. J., Goes, F. S., Cullen, B., Wang, Y., Greenberg, B. D., Fyer, A. J., McCracken, J. T., Geller, D., Murphy, D. L., Knowles, J. A., Rasmussen, S. A., McLaughlin, N. C., Piacentini, J., Pauls, D. L., Stewart, S. E., Shugart, Y., Maher, B., ... & Nestadt, G. (2014). Hoarding in children and adolescents with obsessive-compulsive disorder. *Journal of Obsessive-Compulsive and Related Disorders*, 3(4), 325–331.
- Sareen, J., Henriksen, C. A., Bolton, S. L., Afifi, T. O., Stein, M. B., & Asmundson, G. J. G. (2013). Adverse childhood experiences in relation to mood and anxiety disorders in a population-based sample of active military personnel. *Psychological Medicine*, 43(1), 73–84.
- Scahill, L., Dimitropoulos, A., McDougle, C. J., Aman, M. G., Feurer, I. D., McCracken, J. T., Tierney, E., Pu, J., White, S., Lecavalier, L., Hallett, V., Bearss, K., King, B., Arnold, L. E., & Vitiello, B. (2014). Children's Yale-Brown obsessive-compulsive scale in autism Spectrum disorder: component structure and correlates of symptom checklist. *Journal of the American Academy of Child & Adolescent Psychiatry*, 53(1), 97–107.
- Steketee, G., Kelley, A. A., Wernick, J. A., Muroff, J., Frost, R. O., & Tolin, D. F. (2015). Familial patterns of hoarding symptoms. *Depression and Anxiety*, 32(10), 728–736.
- Storch, E. A., Muroff, J., Lewin, A. B., Geller, D., Ross, A., McCarthy, K., ... Steketee, G. (2011). Development and preliminary psychometric evaluation of the Children's Saving Inventory. *Child Psychiatry & Human Development*, 42(2), 166–182.
- Storch, E. A., Rahman, O., Park, J. M., Reid, J., Murphy, T. K., & Lewin, A. B. (2011). Compulsive hoarding in children. *Journal of Clinical Psychology*, 67(5), 507–516.
- Tolin, D. F., Frost, R. O., Steketee, G., & Fitch, K. E. (2008). Family burden of compulsive hoarding: Results of an internet survey. *Behaviour research and therapy*, 46(3), 334–344.
- Tolin, D. F., Meunier, S. A., Frost, R. O., & Steketee, G. (2010). Course of compulsive hoarding and its relationship to life events. *Depression and Anxiety*, 27(9), 829–838.
- Tolin, D. F., Stevens, M. C., Villavicencio, A. L., Norberg, M. M., Calhoun, V. D., Frost, R. O., ... Pearlson, G. D. (2012). Neural mechanisms of decision making in hoarding disorder. *Archives of General Psychiatry*, 69(8), 832–841.
- Weisz, J. R., Chorpita, B. F., Palinkas, L. A., Schoenwald, S. K., Miranda, J., Bearman, S. K., ... Gray, J. (2012). Testing standard and modular designs for psychotherapy treating depression, anxiety, and conduct problems in youth: A randomized effectiveness trial. *Archives of General Psychiatry*, 69(3), 274–282.
- Woody, S. R., Kellman-McFarlane, K., & Welsted, A. (2014). Review of cognitive performance in hoarding disorder. *Clinical Psychology Review*, 34(4), 324–336.
- Zaboski, B. A., Merritt, O. A., Schrack, A. P., Gayle, C., Gonzalez, M., Guerrero, L. A., Dueñas, J. A., Soreni, N., & Mathews, C. A. (2019). Hoarding: A meta-analysis of age of onset. *Depression and Anxiety*, 36(6), 552–564.