Applying attachment theory to indecisiveness in hoarding disorder

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ABSTRACT

Research shows that individuals who experience distress when discarding their possessions are more indecisive than individuals who do not experience such difficulty. These individuals report more intense emotional responses and greater intolerance to distress when faced with a discarding task. The aim of this study was to determine whether an insecure attachment style contributes to indecisiveness among individuals with discarding difficulties and whether this association is mediated by emotional reactivity and distress intolerance. This study used a within-group cross-sectional design. One hundred fifty-six participants with clinically significant discarding problems (82.7% female; *Mean age* = 21.96, *SD* = 7.38) from a population of university students and community members completed self-report questionnaires that assessed severity of hoarding behaviours, insecure attachment styles, emotional reactivity, distress intolerance, and indecisiveness. Analyses revealed that an anxious attachment style was associated with greater indecisiveness, and this relationship was mediated by emotional reactivity, but not distress intolerance. Furthermore, avoidant attachment was not related to indecisiveness. Clinical interventions should consider the role of attachment styles in hoarding disorder and address emotional reactivity difficulties in treatment through the use of discarding exposures, as emotion plays an important role in these decision-making processes.

1. Introduction

Individuals who meet diagnostic criteria for hoarding disorder (HD) experience intense anxiety when simply thinking about parting with their belongings (Frost et al., 1995; Phung et al., 2015). Attempts to avoid and escape this distress contribute to failures in making decisions about what to discard and result in excessive accumulation of clutter that impairs the functional use of the home (American Psychiatric Association, 2013; Frost and Hartl, 1996). The triple vulnerability model postulates three factors interact and contribute to the development of psychological disorders. This model considers HD to be an emotional distress disorder characterised by one disorder-specific and two transdiagnostic factors (e.g. general biological and psychological; Raines et al., 2016). An important general biological factor may be the tendency to experience emotions intensely, whereas a general psychological factor might be the belief that one is unable to tolerate emotions. A recent study found that individuals with HD and individuals with other psychological disorders rated themselves as less capable of tolerating distress than did healthy controls (Norberg et al., under review). This same study also found that HD individuals experienced more distress after an acute stressor than healthy and clinical controls because they were more distressed before the task began rather than being more

emotionally reactive to the task. However, examination of group effects may hide individual differences. Prior research using experimental paradigms to induce distress among HD individuals has shown that some individuals do not respond to these paradigms, while others react intensely (Crone and Norberg, 2018; Norberg et al., 2015). Understanding what contributes to emotional reactivity and distress intolerance will help us refine our theoretical models for HD.

Consideration of attachment theory may help us understand HD individuals' emotional reactivity and perceived inability to tolerate distress. In early childhood, infants form bonds with primary caregivers who serve as a source of safety and emotional support (Bowlby, 1969; Mikulincer and Shaver, 2012). When caregivers regularly respond to infants' needs, infants develop a secure emotional attachment style. Being regularly cared for and provided with support provides these infants with opportunities to learn how to adaptively manage and tolerate their emotions (Bowlby, 1973; Brumariu, 2015; Esbjorn et al., 2012). However, when primary caregivers are unavailable or inconsistent in their responses to an infant's needs and emotional states, an insecure emotional attachment can develop (Ainsworth, 1979). In more extreme cases, unsupportive caregiver-child relationships may give rise to experiences of interpersonal trauma in early childhood (e.g. physical and emotional neglect or abuse), and in turn, interpersonal trauma

provokes the development of anxious or avoidant attachment styles, as it involves the belief that others will not meet the individual's emotional needs in times of peak distress (Erozkan, 2016; Ozcan et al., 2016). In response to insecure emotional attachments, some children learn to reduce their distress by turning their attention away from threatening information and away from the unreliable caregiver, subsequently inhibiting emotions and interpersonal interaction (Koehn and Kerns, 2018). These children thus learn to self-regulate their distress through avoidance of emotion. In adulthood, this avoidant attachment style is associated with emotional blunting, whereas an anxious attachment style is associated with emotional reactivity (Wei et al., 2005). Anxiously attached children learn to be constantly on guard for danger, which increases or heightens expressions of emotion, and encourages attachment behaviours when they may not be appropriate. In this latter case, children learn to escape their emotions. However, either form of negative reinforcement (e.g. escaping vs avoiding emotions) should consequently prevent children from learning that they can tolerate their own distress (Cassidy, 1994; Esbjorn et al., 2012).

Based on attachment theory, excessive emotional attachment to objects may develop from insecure attachment styles as a method to calm oneself. For individuals with HD, objects may serve as a source of comfort and compensate for the absence of secure relationships with people (Frost and Hartl, 1996). Previous research has found that individuals with HD report negative early childhood experiences, such as a lack of emotional support and negative recollections of family warmth (Kyrios et al., 2018), and report higher levels of anxious and avoidant attachment (Grisham et al., 2018; Medard and Kellett, 2014; Neave et al., 2016; Norberg et al., 2018). Individuals with HD form intense emotional attachments to their possessions (Dozier et al., 2017; Frost and Gross, 1993; Grisham et al., 2009; Nedelisky and Steele, 2009) and often report experiencing a grief-like loss when discarding (Frost and Steketee, 1999). Among anxiously attached individuals, objects may substitute for reliable interpersonal relationships for individuals who actively seek the social support they are lacking, as demonstrated when anxious attachment is experimentally induced (Keefer et al., 2012; Norris et al., 2012). On the other hand, objects may serve as an avoidant coping strategy for those who are avoidantly attached, as demonstrated by averting attention away from a stressor in experimental studies of attentional bias (Krohne and Hock, 2011). For individuals who hoard, having intense emotional attachments to and deriving a sense of comfort from one's possessions may make it difficult for people to decide which objects to save or discard and ultimately contribute to the development of HD.

Individuals with HD often report decision-making difficulties (Frost and Hartl, 1996; Steketee and Frost, 2003). Although their performance on neuropsychological decision-making tasks do not always correspond to these perceived deficits in cognitive ability (Grisham et al., 2010; Hartl et al., 2004; Pushkarskaya et al., 2017), a handful of studies have shown that HD individuals exhibit higher levels of anxiety and distress than do healthy controls when asked to categorize or discard their possessions (Grisham et al., 2010; Luchian et al., 2007; Tolin et al., 2012; Wincze et al., 2007). Furthermore, fMRI research shows that HD individuals, but not healthy controls, experience brain activation in areas associated with the identification of emotionally salient stimuli and with the generation of emotional responses when making discarding decisions (Tolin et al., 2012). Thus, decision-making difficulties in HD may result from emotion dysregulation rather than from cognitive impairment.

The above findings and theoretical assumptions (e.g. attachment theory, disorder-specific factors, transdiagnostic factors) led us to hypothesize that (1) among individuals who experience clinically significant discarding problems, greater anxious and avoidant attachment styles are associated with greater levels of impaired decision making and that (2) this expected relationship between an anxious attachment style and indecisiveness would be mediated by both emotional reactivity and distress intolerance, but that (3) the expected relationship

between an avoidant attachment style and indecisiveness would be mediated only by distress intolerance.

2. Methods

2.1. Participants and procedure

Undergraduate students were recruited using a screener that was distributed to all first year psychology students, whereas community members were invited to participate in the research via advertisements on social media and flyers posted around the university's campus. Social media advertisements and flyers showed a picture of a cluttered bedroom, office, or closet and asked people to participate in the study if they "hate throwing things away". As we were interested in assessing individuals who have trouble making discarding decisions, only individuals who scored 14 or higher on the Difficulty Discarding subscale of the Saving Inventory-Revised (SI-R; Frost et al., 2004) participated in this study. This cut-off score for inclusion is one standard deviation below the mean score for individuals with HD, which is the minimum score that would indicate clinically significant discarding problems (Frost and Hristova, 2011). Of the 1557 individuals who completed the SI-R pre-screener questionnaire, 620 (39.8%) people scored 14 and above. Our sample comprised of 156 participants (see Table 1 for a summary of participant characteristics).

First, participants provided voluntary informed consent. Next, they completed self-report questionnaires. Following completion of the study, participants were debriefed and reimbursed for their time. First-year psychology students received course credit ($n = 93$) and other participants received $20 compensation ($n = 63$). Ethical approval was provided by the university's Human Research Ethics Committee in accordance with the National Statement on Ethical Conduct in Human Research.

2.2. Materials

2.2.1. Demographics

The pre-screening survey collected information about participants' gender, age, and ethnicity.

2.2.2. Saving inventory-revised (SI-R)

The SI-R is a 23-item self-report measure that evaluates severity of hoarding behaviours (Frost et al., 2004). Items assess compulsive acquiring, difficulty discarding, and clutter, which make up three

Table 1
Demographic and clinical characteristics.

Measure	N (%)	M (SD)
Proportion female	129 (82.7)	
Ethnicity		
Anglo Australian	58 (37.2)	
Asian	71 (45.5)	
European	10 (6.4)	
Middle Eastern	10 (6.4)	
Other	7 (4.4)	
Age		21.96 (7.38)
SI-R total		44.81 (11.20)
SI-R acquisition		14.21 (4.79)
SI-R discarding		17.95 (3.10)
SI-R clutter		12.65 (6.68)
ECR-RS avoidance		3.38 (1.18)
ECR-RS anxiety		4.75 (1.63)
DII		41.28 (12.29)
ERS		45.86 (17.00)
FIS		41.57 (10.53)

SI-R, saving inventory-revised; ECR-RS, experiences in close relationships–relationship structure; DII, distress intolerance index; ERS, emotional reactivity scale; FIS, frost indecisiveness scale.

corresponding subscales. Participants indicate the extent to which they have experienced each item during the last week on a 5-point Likert-type scale from 0 (*none/not at all/never*) to 4 (*almost all/extreme/very often*). Higher scores indicate greater severity of hoarding behaviours. The clinical cut-off for the total score is 41, with an average clinical score of 62.0 (*SD* = 12.7) and an average non-clinical score of 23.7 (*SD* = 13.2). The SI-R discriminates well between individuals with and without hoarding difficulties and has previously demonstrated good test-retest reliability, convergent and divergent validity, and strong internal consistency (Total: α = 0.92; Acquisition: α = 0.87; Clutter: α = 0.91; Discarding: α = 0.88; Frost et al., 2004). In the present study, the SI-R total scored demonstrated an α = 0.86. While the acquisition and clutter subscales demonstrated adequate internal consistency (Acquisition: α = 0.75; Clutter: α = 0.88), the discarding subscale achieved poor internal consistency (α = 0.58), likely due to a restricted range of scores attributable to our designated minimum selection criteria on this subscale (Cortina, 1993). In support of this assumption, the discarding subscale achieved an α = 0.88 when using all participants' scores from the pre-screener.

2.2.3. Distress intolerance index (DII)

The DII is a 10-item self-report measure assessing the component of emotion regulation associated with the ability to endure negative emotional states (McHugh and Otto, 2012). The Anxiety Sensitivity Index (Peterson and Reiss, 1992), Frustration Discomfort Scale (Harrington, 2005), Discomfort Intolerance Scale (Schmidt et al., 2006), and Distress Tolerance Scale (Simons and Gaher, 2005) were adapted to compose the DII, which parsimoniously merges the different aspects of distress intolerance into one measure. Items assess feelings of distress, and participants indicate the degree to which they agree with statements on a 7-point Likert-type scale from 1 (*very strongly disagree*) to 7 (*very strongly agree*). A 7-point scale was used rather than the original 5-point scale as 7-point scales have been found to be psychometrically more robust (Preston and Colman, 2000). Higher scores indicate greater problems with tolerating distress. The DII has previously demonstrated excellent internal consistency (α = 0.91) and concurrent validity with behavioural measures of distress intolerance (McHugh and Otto, 2012). In the present study, the DII achieved an α = 0.89.

2.2.4. Experiences in close relationships—relationship structures questionnaire (ECR-RS)

Adapted from Brennan et al. (1988), the ECR-RS is a 9-item self-report measure that consists of two subscales assessing anxious and avoidant attachment styles (Fraley et al., 2011). Items are statements about close interpersonal relationships in general, and participants indicate the degree to which they agree with each statement on a 7-point Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Scores are averaged, with higher scores indicating greater anxious or avoidant attachment. For the anxious subscale, the average clinical score is 4.99 (*SD* = 1.72), while the average non-clinical score is 2.77 (*SD* = 1.56). For the avoidant subscale, the average clinical score is 3.72 (*SD* = 1.18), while 2.76 (*SD* = 0.90) is the average non-clinical score (Grisham et al., 2018). Both scales have previously demonstrated strong internal consistency (α ≥ 0.83; Fraley et al., 2011) as well as convergent and discriminant validity. In the present study, the ECR-RS anxious subscale achieved an α = 0.85, while the avoidant subscale achieved an α = 0.79.

2.2.5. Emotional reactivity scale (ERS)

The ERS is a 21-item self-report measure that measures the degree to which individuals typically react to emotionally salient stimuli (Nock et al., 2008). Items are statements about experiences of emotional intensity, sensitivity, and duration, and participants indicate the degree to which they experience each item on a regular basis on a Likert-type scale from 0 (*not at all like me*) to 4 (*completely like me*). Higher scores indicate greater levels of emotional reactivity. The

average score was 43.31 (*SD* = 19.98) in a clinical hoarding sample (Shaw et al., 2015), whereas the average score was 29.42 (*SD* = 15.42) for a non-clinical sample (Zelkowitz and Cole, 2016). The ERS has previously demonstrated strong internal consistency (α = 0.94; Nock et al., 2008), as well as convergent and divergent validity with other emotional reactivity measures. In the present study, the ERS achieved an α = 0.93.

2.2.6. Frost indecisiveness scale (FIS)

The FIS is a 15-item self-report questionnaire that measures degree of difficulty in making decisions (Frost and Shows, 1993). In the present study, items were reverse-valanced as has been done in cross-cultural validation research (e.g. Patalano and Wengrovitz, 2006; Swami et al., 2008), such that participants indicated the degree to which they agreed or disagreed with each item on a Likert-type scale from 1 (*highly agree*) to 5 (*highly disagree*). Lower scores indicate greater difficulties with decision making. In previous cross-cultural studies, 49.07 (*SD* = 8.48) was the average non-clinical score (Swami et al., 2008). The FIS has previously demonstrated good convergent validity and internal consistency (α ≥ 0.87; Frost and Shows, 1993). In the present study, the FIS demonstrated an α = 0.86.

2.3. Statistical analyses

We conducted a series of zero-order correlations to describe the sample and to assess preliminary relations among attachment styles, emotional reactivity, distress intolerance, and decision-making difficulties to determine whether we could proceed with testing mediation. Based on these correlational findings (see preliminary analyses below), we only proceeded with conducting basic mediation analyses using Model 4 from Hayes (2016) PROCESS v2.16 macro to assess whether the relationship between an anxious attachment style (X) and decision making (Y) was mediated by emotional reactivity (M1) and distress intolerance (M2). This model reports the total, direct, and indirect effects and path coefficients as well as bias-corrected confidence intervals for the indirect effects calculated from 5000 bootstrap samples (Hayes, 2012). The total effect assesses the simple relationship between the predictor (X) and outcome (Y) variables, whereas the direct effect assesses the relationship between predictor and outcome holding constant the mediating variables. The individual path coefficients describe the simple relationships between the predictor variable and mediators as well as between the mediators and outcome. Indirect effects assess the amount of mediation. Completely standardised indirect effects are reported as measures of effect size. Small, medium, and large effects are 0.02, 0.13, and 0.26 respectively (Cheung, 2009; Preacher and Kelley, 2011). Following the advice of Sheets and Braver (1999), to increase our confidence in the observed effects, we conducted additional analyses that reversed the proposed mediators with the outcome. All statistical analyses were conducted using SPSS 25.0.

3. Results

3.1. Preliminary analyses

Zero-order correlations assessing the simple bivariate relationships between predicting, mediating, and outcome variables are reported in Table 2. Anxious attachment was statistically significantly associated with indecisiveness, distress intolerance, and emotional reactivity, and the strength of these correlations was moderate to large. Avoidant attachment was not associated with emotional reactivity, distress intolerance, or indecisiveness. Emotional reactivity and distress intolerance were statistically significantly associated with indecisiveness. Given these findings, we only proceeded with testing mediation for anxious attachment and indecisiveness.

Table 2
Zero-order correlations.

	1	2	3	4	5	6	7
1. FIS	–						
2. ECR-RS avoidance	−0.10	–					
3. ECR-RS anxiety	−0.34**	0.15	–				
4. DII	−0.38**	−0.09	0.38**	–			
5. ERS	−0.46**	−0.05	0.57**	0.59**	–		
6. SI-R total	−0.26**	0.01	0.06	0.11	0.23**	–	
7. SI-R discarding	−0.26**	0.00	0.06	0.03	0.12		–

FIS, frost indecisiveness scale; ECR-RS, experiences in close relationships-re-lationship structure; DII, distress intolerance index; ERS, emotional reactivity scale; SI-R: saving inventory-revised.
$p < .05$.
** $p < .01$.

3.2. Mediation

Fig. 1 presents the basic parallel mediation model assessing the hypothesized relationship between anxious attachment (X) and indecisiveness (Y) mediated by emotional reactivity (M1) and distress intolerance (M2). Table 3 presents the indirect effects and effect sizes. The total effect of anxious attachment on indecisiveness was statistically significant ($F_{(1, 147)} = 18.60, p < .001, R^2 = 0.11$), demonstrating that individuals with stronger anxious attachment reported greater difficulties with decision making. A stronger anxious attachment style also was associated with increased emotional reactivity and with increased intolerance to distress. In turn, greater emotional reactivity was associated with more indecisiveness, whereas the relationship between anxious attachment and indecisiveness was not mediated by distress intolerance. The model's direct effect was not statistically significant

($t = −1.27, p = .205$), indicating that emotional reactivity fully mediated the relationship between anxious attachment and indecisiveness. Completely standardised indirect effects suggested moderate to large effect sizes, falling between 0.13 (medium effect) and 0.26 (large effect). Examination of the indirect effects supports the findings of the individual pathway coefficients, which assessed simple relationships between anxious attachment and the mediating variables (emotional reactivity, distress intolerance) and between the mediating variables and indecisiveness.

In the first reversed model, distress intolerance and indecisiveness partially mediated the relationship between anxious attachment and emotional reactivity (direct effect: $b = 3.62, SE = 0.66, CI = 2.32, 4.92$). The majority of the mediating effect was accounted for by distress intolerance ($b = 0.17, SE = 0.04, CI = 0.09, 0.26$) rather than by indecisiveness ($b = 0.06, SE = 0.03, CI = 0.01, 0.13$). In the second reversed model, emotional reactivity ($b = 0.30, SE = 0.05, CI = 0.21, 0.42$) but not indecisiveness ($b = 0.04, SE = 0.03, CI = −0.01, 0.13$), completely mediated the reversed relationship between anxious attachment and distress intolerance (direct effect: $b = 0.36, SE = 0.60, CI = −0.83, 1.54$). Thus, these reversed models support attachment theory in showing that high emotional reactivity may more likely lead to distress intolerance rather than distress intolerance leading to high emotional reactivity. It also provides confidence for our hypothesized model that emotional reactivity may lead to indecisiveness. However, it does not establish causal determination as these data are cross-sectional.

4. Discussion

The aim of the present study was to determine whether greater insecure attachment among individuals with substantial discarding
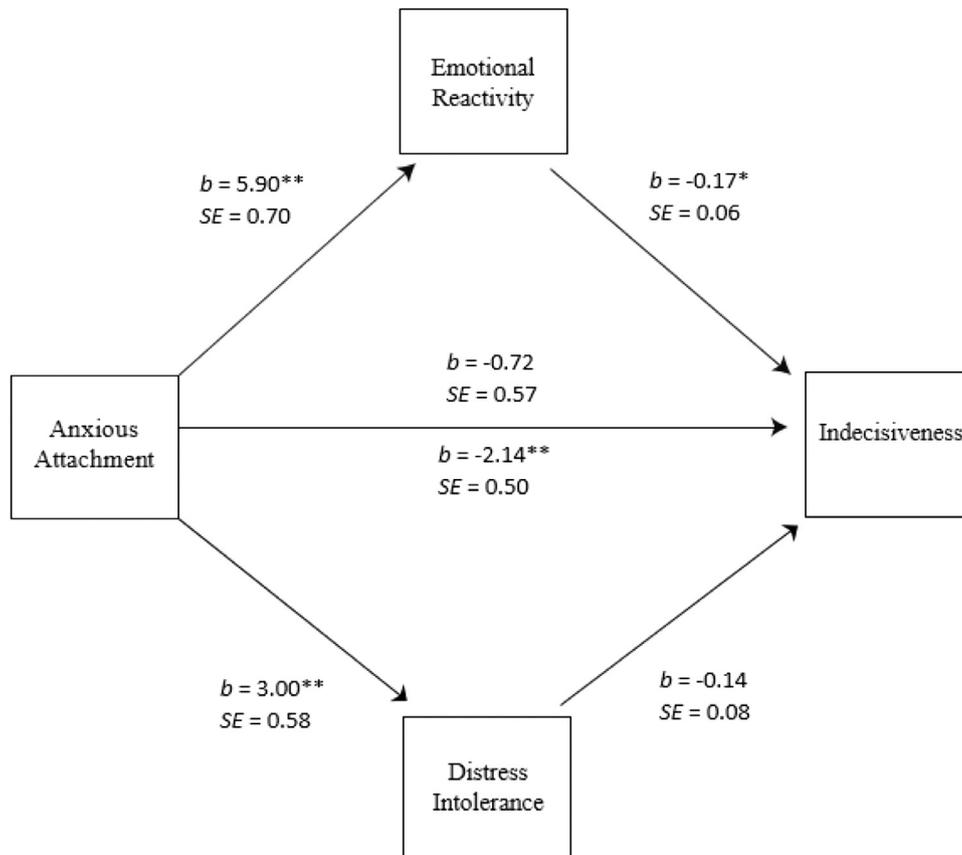
Fig. 1. Basic parallel mediation model. The direct effect of anxious attachment on indecisiveness is presented above the horizontal bottom line, while the total effect of anxious attachment on indecisiveness is presented below the horizontal bottom line. *b:* unstandardized beta coefficient. *$p < .05$. **$p < .01$.

Table 3
Indirect effects of anxious attachment on difficulty discarding.

	Effect (SE)	95% CI	Completely standardized effect (SE)	95% CI
Total indirect effect	−1.41 (0.40)	−2.25, −0.67	−0.22 (0.06)	−0.35, −0.11
Emotional reactivity	−0.99 (0.46)	−1.95, −0.13	−0.15 (0.07)	−0.30, −0.02
Distress intolerance	−0.43 (0.28)	−1.06, 0.06	−0.07 (0.05)	−0.17, 0.01

CI, confidence interval.

difficulties was positively associated with indecisiveness and whether this relationship was mediated by emotional reactivity and distress intolerance. We did not find a relationship between avoidant attachment and other variables of interest. However, we found that greater anxious attachment was associated with greater self-reported difficulties in making decisions and that this relationship was mediated by emotional reactivity, but not distress intolerance.

An anxious attachment style is characterised by frequent doubts about one's self-worth and a reduced ability to manage problems independently (Bowlby, 1969). Anxiously attached individuals are dependent upon others and often experience high emotional reactivity as a way to elicit support and attention from close others (Cassidy, 1994; Mikulincer and Shaver, 2012). When close others are unavailable, anxiously attached individuals may turn to objects for support (Keefer et al., 2012). The emotionally reinforcing properties of objects may then in turn make it difficult to make general decisions about objects. Rather than focusing on the objective characteristics of possessions, they may focus on their subjective properties (e.g., sentimental value; Grisham et al., 2018). Doing so may cause these individuals to feel more distress associated with the process of sorting and categorising objects, which may exacerbate the anxiety they experience when making decisions about what to keep or discard. While attachment theory posits that all decisions may be difficult to make, decisions about possessions may be particularly difficult for individuals with hoarding disorder (Tolin et al., 2012). Future studies will want to examine the extent of decision-making difficulties in people who hoard by using hoarding-related and non-hoarding related tasks.

Contrary to our hypothesis, distress intolerance did not mediate the relationship between anxious attachment and indecisiveness. As distress intolerance was moderately correlated with greater decision-making difficulties at the univariate level, these combined findings tell us that distress intolerance is not an independent predictor of decision-making. Previous studies have largely found mixed evidence for the role of distress intolerance in hoarding. Although some studies have found that distress intolerance predicts greater hoarding severity and compulsive buying (Grisham et al., 2018; Norberg et al., 2018; Williams, 2012), many studies have not found distress intolerance to independently predict general hoarding severity when factors such as mood are controlled during analysis (Mathes et al., 2017; Norberg et al., 2015; Phung et al., 2015; Timpano et al., 2009). The current study supports these latter findings and suggests that it may be most important to focus on reducing an individual's experience of emotions (e.g. sensitivity, intensity, persistence of negative emotions). As emotion plays an important role in decision-making processes, avoidance of decision-making may escalate distress in the long-run through failure to resolve the original problem that led to the distress and by reinforcing beliefs that negative emotions are dangerous and must be avoided (Loewenstein et al., 2001; Maner and Schmidt, 2006). Thus, helping individuals reduce their avoidance of decision making could reduce their distress, improve their decision-making abilities, and reduce their hoarding severity.

Although there is some evidence to suggest that hoarding is associated with avoidant attachment (Medard and Kellett, 2014; Neave et al., 2016), our hypothesis that distress intolerance would mediate the relationship between avoidant attachment and impaired decision-making also was not supported. The theoretical and empirical research

on attachment-styles has noted differences in coping strategies between anxious and avoidant interpersonal styles, while also noting that both types of insecure attachment are broadly related to maladaptive affect regulation and distress intolerance (Shaver et al., 2007; Wei et al., 2005). In distressing situations, anxiously attached individuals tend to experience an intense reaction and employ this reaction to elicit support from others, whereas avoidantly attached individuals are blocked from their emotions, downplay their need for support, and distance themselves from other people (Shaver and Mikulincer, 2002). As avoidantly attached individuals are emotionally distanced, they may not typically experience situations in which they are required to tolerate distress, and therefore, they may not accurately self-report their reactions to distressing situations. For this reason, it is imperative that future studies utilise a multi-modal assessment of distress intolerance to better determine how avoidantly attached individuals react when exposed to distressing situations.

Our uni-modal trait assessment of distress intolerance may explain why we did not find a significant mediation effect with distress intolerance. As with many distress tolerance studies (Cougle et al., 2011; Mathes et al., 2017; Norberg et al., 2015; Timpano et al., 2011), we only examined one's perceived inability to tolerate distress through self-report measures. Distress intolerance reflects not only one's perceived intolerance of negative emotions, but also one's ability to endure negative emotions when confronted by stressful circumstances (Zvolensky et al., 2010). Self-report measures tend to tap the former, while behavioural measures tend to gauge the latter, and often these measures only mildly correlate with each other (McHugh and Otto, 2012; Veilleux et al., 2017). When using multi-modal assessments of distress intolerance, HD individuals' behavioural persistence on a stressful mirror-tracing task did not differ from community controls, despite greater self-reported distress intolerance (Norberg et al., under review). Thus, future research should utilise behavioural distress intolerance measures alongside self-reports to fully rule-out that distress intolerance is not an independent predictor of one's decision-making capabilities.

4.1. Clinical implications

The present study has a number of important clinical implications. First, existing hoarding treatment could be enhanced by tailoring treatment interventions based on an individual's interpersonal attachment style. Therapists may address this component by teaching anxiously attached individuals how to effectively obtain interpersonal support as a means for decreasing aversive emotions. Second, therapists may help anxiously attached individuals increase their self-regulation skills by incorporating specific skills training into existing cognitive behavioural therapy for HD. For example, individuals with HD may benefit from modules utilised in Affect Regulation Training (Berking and Whitley, 2014), such as learning how to be non-judgmental of one's negative emotions, how to tolerate negative emotions, and how to support oneself compassionately. These affect-regulation modules may be most beneficial for HD clients with anxious attachment styles. Therapists could have clients practice these skills when making discarding decisions.

4.2. Limitations

The findings of the present study should be interpreted considering its limitations. First, although we reversed our mediators and outcome to strengthen our confidence in our proposed model, the study relied on self-report and was cross-sectional in nature. This cross-sectional study and others (e.g. Norberg et al., 2015; Shaw et al., 2015) have identified key variables that now warrant a longitudinal investigation. Thus, future research should utilise a longitudinal design to clarify if insecurely attached children exhibit high emotional reactivity, distress intolerance, and decision-making difficulties prior to the onset of HD. Second, experimental manipulations, such as employing an experimental decision-making task related to common hoarding-related decisions (e.g., to acquire or save) rather than using a general indecisiveness measure, would allow for tests of causation. Hoarding-specific decision-making tasks will also allow us to better determine whether discarding decisions are influenced by general or object-specific decision-making difficulties. Third, this study is limited by relying on unimodal assessment. Multi-modal assessments that utilise self-report measures alongside standardised behavioural tasks would allow for a more thorough and comprehensive understanding of the impacts of distress intolerance and emotional reactivity on decision-making. These multi-modal assessments would measure one's perceived intolerance of negative emotions (e.g. distress intolerance questionnaires; McHugh and Otto, 2012) as well as one's behavioural tolerance of negative emotions under stressful circumstances (e.g. behavioural emotional image tolerance tasks; Veilleux et al., 2017). A fourth limitation concerns the poor internal consistency of the SI-R difficulty discarding subscale ($\alpha = 0.58$). As this low alpha seems due to restricting our sample to those with clinically significant discarding problems and having most participants score close the clinically significant cut-off score, future studies will want to use recruitment methods that secure participants who score at the upper end on the SI-R. Fifth, although participants scored within the clinical range for discarding difficulties, we did not include a diagnostic interview, and thus, we do not know how many participants met diagnostic criterion for HD. Future studies should include clinician-administered diagnostic interviews in order to validate HD diagnoses. Lastly, although participants were of varying ethnicities, most were female and the average age was 21.96 years. Given that participants were selected from a population of students and community members, future studies may benefit from selecting participants from a broader age range to increase the generalisability of findings. Furthermore, future studies may benefit from having a large sample of male participants to examine if gender moderates the mediational effect of emotional reactivity and distress intolerance on decision making. Prior research has found that the impact of emotional attachment style is less intense for men (Phung et al., 2015).

4.3. Conclusion

Overall, findings from the current study broadly support the triple vulnerability model (Raines et al., 2016) and the cognitive-behavioural model of hoarding (Frost and Hartl, 1996), demonstrating that decision-making difficulties in HD are associated with transdiagnostic factors—emotional reactivity and an anxious attachment style. Our results highlight the importance of examining individual-level differences (e.g. interpersonal attachment) in HD and suggest that general emotional processes (e.g. emotional reactivity) may underlie experiences of indecisiveness, such that formation of healthy, early interpersonal attachments may determine one's experience of emotions, which may in turn contribute to decision-making abilities. Future research should replicate these findings using multi-modal assessments that include behavioural tasks in addition to self-reports to ensure that distress intolerance does not independently affect decision-making in HD. Until then, interventions for HD will want to incorporate modules that enhance interpersonal relationships and reduce emotional reactivity.

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