

From Physical Hoarding to Digital Hoarding: The New Manifestations of Hoarding Disorders in the Present Era

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Abstract. Hoarding has functioned as an adaptive survival strategy throughout human evolution, enabling individuals to cope with uncertain and fluctuating resource availability. In contemporary societies, this propensity has extended into the digital domain, giving rise to the phenomenon of digital hoarding. Digital hoarding refers to the excessive accumulation and retention of digital materials, accompanied by a marked reluctance to delete them; it cannot be reduced to ordinary practices of digital archiving or backup. It is further characterised by its high concealability, the relatively low economic and practical costs of storage, and the minimal external pressure or social sanction to discard possessions. This paper argues that digital and physical hoarding share common motivational foundations, including efforts to mitigate anxiety about potential resource loss and to preserve objects imbued with personal or sentimental significance. Maladaptive perfectionism and insecure attachment styles jointly contribute to the development of digital hoarding tendencies, which are subsequently reinforced by technological affordances (such as inexpensive, large-capacity storage) and broader sociocultural norms that valorise data accumulation and constant connectivity. Given that digital hoarding is emerging as a salient mental health concern, future research should prioritise the design and evaluation of targeted cognitive interventions for hoarding disorder and examine the legal, cultural, and policy contexts that shape digital possession, storage practices, and deletion norms.

Keywords: Digital hoarding, attachment anxiety, maladaptive perfectionism, emotional regulation difficulties, information management.

1. Introduction

Throughout millions of years of human evolution, among the numerous adaptive behaviors that have emerged, hoarding serves as a survival strategy to cope with resource uncertainty—and is widely observed in nature. Many animals hoard food and supplies to prepare for uncertain future possibilities, and such behavior often ceases as survival pressures diminish. However, when such behavior deviates from rational control and exhibits pathological accumulation characteristics, such as excessively collecting items that have lost their usefulness and affect mental health, it may evolve into a psychological disorder known as hoarding disorder. According to the Diagnostic and Statistical Manual of Mental Disorders (Fifth Edition) (DSM-5), its main characteristic is the difficulty in giving up valuable items, such as hoarding cardboard boxes, household waste, or a large amount of unused clothing, resulting in severe occupation of living space, accompanied by significant anxiety and pain, ultimately interfering with normal personal social and work functions. With the advent of the information age and the rapid development of technology, the objects and scenarios of hoarding behavior have changed. Pathological hoarding behavior is gradually reflected in the field of digital information, and a new form of hoarding has emerged, namely digital hoarding. It should be noted that digital hoarding is different from digital backup. It does not refer to purposeful data backup or reasonable resource storage, but rather to the behavior of individuals who continuously collect a large amount of unvisited or unused digital content without the actual usage intention to use them and are unwilling to delete them. Ultimately, it may impair an individual's mental health and daily functioning.

From a psychological perspective, digital hoarding disorder, as a new manifestation of traditional hoarding disorder, has gradually become an important object of exploration for researchers in terms of its underlying influencing factors and psychological mechanisms [1].

Therefore, this review first compares the relationship between digital hoarding and real-life hoarding, focusing on their similarities in symptoms and functional impairments, as well as highlighting the unique manifestations of related symptoms in the digital environment. To further reveal its motives, this study will introduce important psychological mechanisms such as attachment theory and executive dysfunction and aims to construct an integrated explanatory framework that links psychological vulnerability to explicit behavioral manifestations, focusing on core psychological experiences such as "deletion difficulties," "emotional regulation disorders," and "lack of control over digital objects."

Based on theoretical integration, this review will further explore the significance of digital hoarding in clinical practice and social aspects. At the clinical level, DH is closely related to issues such as anxiety, depression, and decreased work efficiency; At the societal level, it involves challenges such as information overload, digital health, and data security. Therefore, the framework proposed in this study not only expands the understanding of digital hoarding as a clinical problem but also provides reference for intervention and policy formulation at the social level, and provides reference direction for future research and practical applications.

2. Symptoms of Hoarding Disorder

Behaviors involving the collection and storage of items are observed from childhood to old age. Normal collection has certain social adaptability, but excessive and pathological hoarding of related items can seriously affect an individual's normal life and function, leading to hoarding disorders. Hoarding disorder is a newly added disease in DSM-5, with a prevalence rate of approximately 2% to 6% in the general adult population, and there is no significant gender difference; The incidence of the disease in the elderly population is relatively high, even reaching 7% to 10%, and more than 70% of patients have a condition that is directly proportional to their age. Measured by the severity threshold, males over 45 years old have a higher hoarding rate than females.

The former hoarding disorder was considered a subtype of obsessive-compulsive disorder or obsessive-compulsive personality disorder, but through in-depth research by researchers, it has been found that there are essential differences between the two. Hoarding behavior is usually a chronic and progressive development, so hoarding disorder is a cognitive behavioral developmental disorder. Contemporary scientists have separated hoarding disorder from obsessive-compulsive disorder (OCD) and obsessive-compulsive personality disorder (OCPD) as a new type of mental illness. The typical symptoms of hoarding disorder can be summarized as three core symptoms: "excessive acquisition", "difficulty in discarding", and "spatial disorder". Some conclusions also point out that it is mainly caused by four aspects, namely insufficient information processing, unreasonable beliefs, difficulty in emotional regulation, and severe hoarding behavior [2].

Individuals may over acquire to compensate for internal insecurity or lack of identity. Secondly, they are unable to establish harmonious and healthy relationships with others and the surrounding environment through normal means, and subsequently exhibit severe over acquisition and difficulty in discarding the items they already possess, ultimately leading to a messy and cluttered living space, ignoring, or blocking external influences. The disorder level of the patient's living space far exceeds the normal range and cannot be improved through routine organization [3].

Further research has found that patients with hoarding disorders generally have a high level of vigilance and anxiety towards external intrusion into their personal space, fearing that others' contact or movement of their belongings will weaken their sense of control. In addition, the safety hazards caused by the accumulation of items cannot be ignored, as they not only affect personal life, but also pose a threat to public safety and health. Including increased fire risk (such as paper and fabric accumulation encountering open flames), hygiene issues, emergency passage blockages causing

obstructions during emergencies and prevent escape during fires; Due to clutter, work efficiency is greatly reduced or even unable to work; Family members may move away due to their inability to tolerate the environment, leading to the breakdown of family relationships; Excessive shopping and picking up items may lead to financial difficulties for families. Patients with hoarding disorders may also have other illnesses themselves. A survey shows that approximately 75% of HD patients also suffer from a series of emotional disorders, mainly anxiety. In addition, attention deficit is also very common among HD patients. These individual clinical discomfort reactions caused by HD are often the chief complaint symptoms of patients when seeking medical treatment.

3. Concept and Symptoms of Digital Hoarding

Due to the relatively new nature of digital hoarding, there is currently no unified definition and diagnostic criteria for it in the academic community both domestically and internationally. The earliest research on this behavior appeared in Dabbish's related research reports in the field of personal information management. When studying email processing behavior, he found that although users only reply to about one-third of emails, they tend to retain nearly half of the received content, showing a clear tendency of "retaining more than using" [4]. However, this tendency to 'reserve more than use' reflects people's reliance on a sense of security regarding information. Later, Martine Bennekom in the field of psychiatry published a case report on patients with digital hoarding disorder in *BMJ Case Reports*, which clearly defined the concept of digital hoarding and provided detailed empirical analysis. It points out that digital hoarding is when users accumulate excessive digital files, to the point of losing a clear perspective, ultimately leading to stress and confusion [5]. When such behavior begins to significantly affect daily life, it can be considered pathological.

In addition to the above two areas, in the field of psychology, Sweeten's research indicates that digital hoarding refers to the excessive accumulation of digital materials such as emails, photos, files, and software, exhibiting characteristics similar to physical hoarding [6]. Hubler's article suggests that digital hoarding can accompany physical hoarding, manifested as chaotic information, lack of organizational structure, and excessive accumulation of data [7]. Francesco Vitale and others, based on the field of computer science, regard digital hoarding as a tendency to preserve large amounts of digital information. Even if these data are meaningless to others. It holds special emotional and practical significance for the user, who keeps it for emotional or practical reasons and rarely deletes it [8].

While research on digital hoarding is rapidly developing abroad, Chinese scholars have also conducted related studies and provided definitions of digital hoarding. Among them, a more well-known example is in library and information science, where Wang Lin and others, focusing on digital information resources as the core research element, define data hoarding behavior on social media as the indiscriminate storage of data by users and their unwillingness to delete it, occurring alongside the rapid increase in data volume on social media and the reduced cost of storing data [9].

In summary, in the current related research, 'digital hoarding' as an emerging concept has not yet reached a unified definition in the academic community.

4. Psychological Mechanisms of Digital Hoarding

4.1. Emotion and Attachment Mechanisms

A well-known framework for analyzing the dynamics of interpersonal relationships and their effects on human behavior and development is Bowlby's attachment theory. It provides crucial insights into the emotional and relational roots underlying digital hoarding behavior. In the face of stress or danger, infants have an inbuilt need to seek safety from their caregivers, according to attachment theory, which also highlights the importance of the infant-caregiver bond [10,11]. It offers a starting point for comprehending the intricacy of interpersonal relationships. Its fundamental tenet is that people have an innate desire to build and preserve interpersonal relationships, to form social

bonds, and to obtain a sense of safety, acceptance, and belonging from these relationships [12]. This need indicates a persistent psychological search for safety and belonging in addition to a dependence on social interactions. People may use control over possessions or digital content to maintain a sense of order and safety when interpersonal security is threatened or absent. Thus, one alternative method of ensuring security is digital hoarding.

Despite having its roots in studies on infants, attachment theory has since been applied to relationships in adults. Four types of adult attachment have been identified by Bartholomew and Horowitz: fearful, avoidant (dismissive), anxious (preoccupied), and secure [13]. Excessive seeking of validation and approval from others, usually stemming from fears of rejection or abandonment, is a hallmark of "anxious attachment" [14]. High levels of attachment anxiety can cause people to become unduly reliant on attachment figures, which can strain relationships with others [15]. According to research, people may turn to other objects as a coping mechanism when their interpersonal attachment needs are not met or are only partially met [16]. Strong attachment to large quantities of digital items is a significant emotional motive in digital preservation behavior [17–20]. People are more likely to form emotional connections with digital content when it meets their interpersonal needs. High acquisition rates, reluctance to discard, and a propensity to accumulate digital content are consequences of this attachment tendency [21]. These people may obsessively update electronic devices to ensure access to the most recent information and maintain social connections in order to alleviate "fear of missing out." Students, in particular, may engage in digital hoarding as a coping mechanism for anxiety [22, 23]. According to Alexandria et al., personal attachment is similar in both digital and physical hoarding, indicating that attachment to electronic objects is similar to hoarding in the real world [24]. In order to exert control over their surroundings, people with hoarding disorder want to acquire and hold onto items [25]. A desire for psychological stability and order in the face of uncertainty is reflected in this control. People can temporarily reduce anxiety and strengthen their sense of self by maintaining control over their belonging, which in turn feeds their hoarding tendencies.

4.2. Maladaptive Perfectionism as a Moderator of Digital Hoarding

Setting high expectations and being overly self-critical are key characteristics of the perfectionist personality trait [26]. It can take two forms: a maladaptive form where people obsess over the discrepancy between their high expectations and actual performance, which results in unfavorable outcomes, and a beneficial form that encourages high performance, satisfaction, and goal attainment [27]. Numerous issues, including compulsive behaviors like hoarding, have been connected to this maladaptive perfectionism [28].

Zaremohzzabieh et al. claim that people's digital hoarding tendencies are more likely to be triggered and intensified when they have a strong emotional attachment to digital materials and high levels of maladaptive perfectionism. In particular, they exhibit a strong desire to protect "digitally important" content, avoiding removal out of guilt, which further reinforces hoarding behavior and encourages accumulation [29]. Furthermore, perfectionists frequently prefer to have backup plans because they are afraid of making the wrong decision. In a comparative study of hoarders and non-hoarders, McCabe-Bennett et al. showed that decisional procrastination and perfectionism are important predictors of non-physical hoarding, including digital or hybrid forms [30].

Research has yet to examine how maladaptive perfectionism influences digital behaviors despite the fact that people with high levels of maladaptive perfectionism increasingly display obsessive-compulsive symptoms in a variety of contexts [31, 32]. The relationship between maladaptive perfectionism, digital behavior disorders, and associated factors requires further research. Future research should examine how maladaptive perfectionism and digital hoarding interact, particularly how it influences digital saving and deletion behaviors by exaggerating anxiety and indecision. Maladaptive perfectionism moderates the relationship between adult attachment and depression, according to Wei et al., but its moderating effect on digital hoarding has not been investigated. Thus,

more study is needed to comprehend the relationship between maladaptive perfectionism and digital behavior disorders and related mechanisms [33].

5. Factors that Impact Digital Hoarding

The advent of the digital age has promoted the popularization of digital hoarding, which is affected by a variety of psychological and social factors. Individuals with attachment anxiety tend to seek psychological security through digital hoarding due to their fear of uncertainty. From a psychological perspective, individuals with attachment anxiety tend to rely on digital hoarding to gain a sense of security because uncertainty heightens their vigilance toward potential future threats. The survey results in attachment anxiety and digital hoarding behavior: the mediating role of uncertainty tolerance and threats regulation difficulties published by Wu, X. Y. et al. show that attachment anxiety and digital hoarding behavior are positively correlated [34]. It further shows that the formation of attachment patterns of attachment anxiety patients is due to the unstable attitude of their closest others during their growth, which has caused many problems in cognition and emotion. It cannot accept uncertainty and anxiety about the future, so it tends to seek a sense of security through digital hoarding: because there are a large number of digital resources that will provide more sense of security in the face of various problems caused by future uncertainty. For example, when people see a large number of piled up learning materials or piles of working documents, even if you don't need them at present, you will also collect and save a lot to prevent a time when you don't need them in the future. Liu et al. Proposed that fear of missing (FOMO) has a significant positive impact on the accumulation behavior and deletion difficulty. This symptom indicates that these patients may engage in the accumulation of digital resources and other behaviors [35]. At the same time, there are also emotional problems, that is, improper adjustment. For example, when they notice a message has been accidentally lost, they may experience anxiety. This response can be explained by "loss aversion theory", that is, individuals tend to save more digital information to avoid future regret. This phenomenon is just like that some people are reluctant to delete a conversation record when they keep the call record for many days and a long time. Even if such a record is not meaningful in many cases, the deletion of the record will make them feel anxious, so they still maintain a state of refusal, which makes the degree of digital hoarding more serious.

In addition to psychological factors, social and cultural factors can not be ignored. In this era, "consumerism" is also widely spread in the digital field, which makes people constantly buy more digital products. For example, now all kinds of games are emerging in endlessly. The wonderful game posters, exciting trailers and other information have "stuffed" the game into the worldview of ordinary people's hearts, which stimulates players' psychological desire for purchase. Many players buy too many games for "hoarding", but in fact they are not really contacting and experiencing a game. Moreover, in the process of information acquisition, "knowledge sharing", "high-quality product recommendation" and other content involved in the current social platform make some netizens believe that "if there is no hoarding, it will be missed", which undoubtedly leads people into the trap of digital hoarding. Veblen revealed the social status competition and identity function behind consumption, and further provided evidence to show that the consumption concept gradually enhanced people's digital hoarding [36].

On the other hand, some characteristics of digital technology have also led to digital hoarding. For example, the development of network technology and the popularity of mobile terminals make it easy for people to obtain a large amount of information and a lot of content at any time and place; After the popularity of social media, people's behavior of sharing and collecting digital content has become more serious. Moreover, the popularity of cloud storage and the expansion of capacity have created the illusion of "data will never be lost", which has exacerbated the phenomenon of digital hoarding. Some software and platforms check many information storage options by default, and the deletion function is too cumbersome and inconvenient. In addition, the operation method of inducing users to

delete by mistake also objectively contributes to this situation. From a technical point of view, these technological features also contribute to the prevalence of this problem.

6. The Relationship and Transformation from Real Hoarding to Digital Hoarding

The relationship and transformation of real hoarding to digital hoarding is the expression of hoarding behavior adapting to the digital age, and the development and derivation of hoarding psychology in the digital age. At present, the research on this topic can be mainly divided into four dimensions: the root of motivation, the transformation path, key differences, and potential risks.

Hoarding behavior comes from individuals' accumulation to alleviate their anxiety about the loss of resources. Whether it is real hoarding or digital hoarding, the root of its motivation is hoarding behavior as a way to relieve anxiety, and this kind of anxiety mainly comes from panic about the lack of a sense of gain. In reality, it may be manifested as dependence on old items. Individuals are afraid of forgetting the past and save a large amount of information, thus falling into duplication. These two hoarding obstacles are against the uncertain "loss" through "possession" [37]. And objects that are hoarded often have emotional sustenanty for patients with disabilities, such as diaries from a long time ago, or photos with friends, which are kept by patients as emotional carriers.

The transformation from real to digital hoarding is not completed overnight. It is roughly divided into several steps.

The first stage of digital hoarding is only an auxiliary to real hoarding, such as recordings on mobile phones or memos. As time goes by, the reality is hoarding more and more. With the development of the information age, digital hoarding has gradually replaced real hoarding and become the main manifestation of patients with hoarding disorder [37]. For example, a large number of photos and recordings in mobile phones have gradually replaced the preservation function of real items. For example, countless photos, notes and audio and videos on computers or mobile phones. The content of digital hoarding at this stage is far greater than the actual hoarding.

The reason why digital hoarding can replace real hoarding as the current mainstream hoarding obstacle is that it lowers a lot of threshold compared with real hoarding. For example, the cost of real hoarding is relatively high, and you need to spend money to buy cabinets, boxes and other items, which takes up physical space. The cost of digital hoarding is extremely low. For example, the annual fee of cloud storage space is only a few dozen yuan, and the capacity of hard disks is also increasing with the development of technology. Real hoarding is obviously greater psychological pressure on the discardment of digital hoarding. For digital hoarding, cleaning up hoarded items is just a "tap", while cleaning up real hoarding items is more likely to cause "gult". And compared with real hoarding, digital hoarding is more concealed and its hoarding are more blurred. Therefore, it is much more difficult to eliminate digital hoarding than to eliminate real hoarding [38].

7. Future Outlook

In summary, in the current information age, digital hoarding has become very common [39]. Hoarding has become an important social problem affecting information management and mental health. The extremely fast update iteration speed and the emergence of a large number of media will aggravate people's anxiety, bring great psychological pressure, and trigger digital hoarding barriers. Moreover, excessive junk data hoarding will put great pressure on network and server storage [40]. The accumulation of junk data not only affects storage efficiency, but also increases energy consumption and maintenance costs, resulting in waste of digital resources. And further aggravate information security risks. In the future, cognitive intervention for hoarding disorder will be popularized. Through cognitive intervention, patients can alleviate their anxiety, improve their information processing ability, optimize the use of social resources, and reduce the waste of information resources. In the future, society will pay more attention to digital hoarding barriers. There

will be more research to explore the relationship and development of digital hoarding barriers and real hoarding barriers, pay more attention to the social phenomena and cultural impact behind the hoarding barriers, and better understand and study this phenomenon.

8. Conclusion

The symptoms of real hoarding are "excessive acquisition" and "too much inability to discard" at the core, with more diseases than the elderly and accompanied by anxiety and other negative emotions; digital hoarding cannot be defined, which is manifested as whether there is a practical purpose to obtain digital information. Both are clinically motivated by anxiety caused by loss, which are emotional sustenance; digital hoarding It is another special manifestation of reality hoarding. Both aim to alleviate the anxiety of resource loss. The psychological mechanism has anxiety and access, that is, a sense of security, "immature" perfectionism (fear of omissions and deletion and other mechanisms), and the social history and technology of digital consumerism, convenient services and other factors. Influenced by factors, at the same time, digital hoarding itself will also cause individual psychological problems of individual participants and problems related to information security and idle waste of resources in the social dimension. It can be inferred from the above: digital hoarding is a derivative form of real hoarding in the "digital age", and both are essentially pathological behaviors to deal with anxiety. At present, there are obvious shortcomings in the research and intervention of digital hoarding in the scientific community, which is manifested in the weak theoretical model and the lack of interdisciplinary integration. The research objects are mostly limited to college students and lack extensive coverage and longitudinal tracking. In the future, cognitive intervention for hoarding disorders will be popularized. Through cognitive intervention, it can help patients improve their psychological condition and improve their information processing ability. In the future, society will pay more attention to digital hoarding barriers. There will be more research to explore the relationship and development of digital hoarding barriers and real hoarding barriers and pay more attention to the social phenomena and cultural impacts behind hoarding barriers.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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