



## Review

## Seeing human when feeling insecure and wanting closeness: A systematic review

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## ABSTRACT

A systematic review of the literature was conducted to evaluate whether an insecure attachment style is associated with greater anthropomorphic tendencies. We searched eight electronic databases and checked reference lists for eligible studies. After removing duplicates, 1022 titles and abstracts were appraised for eligibility. Eligible studies were those that assessed insecure attachment and anthropomorphism of non-living entities, presented original data, contained sufficient data for computing effect sizes, and were written in English. We deemed 30 articles potentially eligible and read their full texts. Six studies were eligible, with a total of 1341 participants. A quality assessment tool was used to assess the quality of the included studies. Two independent raters achieved 85% agreement on the quality appraisal of the studies. The quality of the included studies was poor, with 10.7% of items coded zero (did not meet criterion at all), and an overall average quality rating of 60%. A narrative review of the eligible studies highlighted that anxious attachment and anthropomorphic tendencies are positively and moderately related, but that attachment avoidance is not related to anthropomorphism. Given the poor quality of the research to date, better quality research is needed to more conclusively establish whether and how insecure attachment styles are related to anthropomorphic tendencies.

## 1. Introduction

Philosophers and theorists from a variety of disciplines have proposed that people have the capacity to see non-human entities like themselves (Darwin, 1872; 2002; Feuerbach, 1873; 2004; Freud, 1930; 1989; Guthrie, 1993, 2016; Hume, 1757; 1956). This capacity to attribute humanlike characteristics, emotions, and intentions to non-human entities is known as *anthropomorphism* (Epley, Waytz, & Cacioppo, 2007). Anthropomorphism may involve attributing humanlike physical characteristics to objects, such as eyes and a mouth to a car, or a humanlike mind to non-humans, such as agency and willpower to a computer. Although early philosophers such as Hume (1757; 1956) suggested that anthropomorphism is a universal tendency for all humankind, more recently researchers have investigated individual-level determinants that influence one's tendency to anthropomorphize non-human agents.

Epley et al. (2007) proposed that three psychological determinants influence anthropomorphic tendencies. First, they theorised that people are motivated to use available knowledge to make inferences about non-human agents. People use heuristics based on their own characteristics and mental states to understand non-human agents. According to Epley and colleagues, these heuristics are easier to apply to

non-human entities that have humanlike features, as 'humanness' is an easy point of reference. The tendency to readily assign human-like characteristics to objects that look humanlike has influenced companies to anthropomorphize their products, such as M&M did with their M&M characters (Fournier, 1994; Fournier & Alvarez, 2012). By assigning physical and personality characteristics to M&Ms (e.g. Ms. Brown), M&M encourages consumers to anthropomorphize their product, which increases likeability and induces positive consumer reactions (Delbaere, McQuarrie, & Phillips, 2011). Likeability leads to purchasing, which then encourages further anthropomorphism of the brand (Alvarez & Fournier, 2016).

Second, Epley et al. (2007) posited that people are motivated to anthropomorphize non-human entities to gain a better understanding of them. According to White (1959), becoming knowledgeable about one's environment establishes predictability, which enhances perceived control. White (1959) referred to one's motivation to explore and seek meaning from the world as *effectance* motivation. Epley et al. (2007) proposed that effectance motivation extends to anthropomorphism in that people are driven to understand non-human agents in order to reduce the anxiety and frustration associated with uncertainty. For example, an individual may view their computer as having mental states when it malfunctions to reduce their frustration with the

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technological device (Waytz, Morewedge et al., 2010). This, in turn, may help the individual understand the increasingly complex technological world.

Third, Epley et al. (2007) proposed that people are motivated to anthropomorphize non-human entities to establish belongingness when they feel disconnected from people. Epley and colleagues termed this the ‘sociality motivational tenet of anthropomorphism’ and posited that situational factors such as one’s current level of loneliness might increase their need for affiliation. For a socially excluded individual, anthropomorphism may alleviate loneliness by providing comfort and establishing a social connection to a non-human agent. Research has shown that socially excluded people seek comfort in non-human agents such as teddy bears (Tai, Zheng, & Narayanan, 2011) and that chronically lonely individuals hold stronger beliefs in the ability of anthropomorphised religious agents to change natural phenomena and see humanlike qualities in their pets to mitigate their loneliness (Epley, Akalis, Waytz, & Cacioppo, 2008; Epley et al., 2007; Guthrie, 2016).

Attachment theory also specifies why socially isolated and lonely individuals may be motivated to anthropomorphize inanimate objects. Attachment theory posits that infants develop a sense of security (coined “felt security” by Sroufe & Waters, 1977) when their caregivers are reliably available and provide support, but that they develop a sense of insecurity when caregivers are not reliably supportive (Hazan & Shaver, 1994; Mikulincer & Shaver, 2016). Supportive caregivers promote feelings of self-worth and positive wellbeing, but rejecting or unavailable caregivers may result in an experience of fear, anxiety or defensiveness (Hazan & Shaver, 1994). These early interactions with caregivers and models of the self in early childhood build the foundation for adult interpersonal relationships (Ainsworth, 1982; Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1988). Secure adults find it easy to become close to and depend on others, but insecure adults do not. Anxiously attached adults are hypersensitive to others’ potential unresponsiveness and unavailability, whereas avoidantly attached adults downplay the importance of close relationships to others (Collins & Read, 1990; Main, Kaplan, & Cassidy, 1985; Maxwell, Spielmann, Joel, & MacDonald, 2013; Mikulincer & Shaver, 2016). To achieve a sense of security and alleviate distress, anxiously attached individuals seek proximity to others and avoidantly attached individuals avoid social contact and engage in non-social activities (Hazan & Shaver, 1994; Maxwell et al., 2013; Mikulincer & Shaver, 2016). According to Epley et al. (2007), insecurely attached individuals may seek security through establishing connections to non-human agents.

Supporting the assumption that objects can substitute for interpersonal attachment, a handful of studies have shown relationships between anxious attachment and object attachment. For example, Whelan, Johnson, Marshall, and Thomson (2016) found that individuals with high levels of attachment anxiety reported more and stronger brand relationships than those with low attachment anxiety. Moreover, Keefer, Landau, Rothschild, and Sullivan (2012) found that individuals primed with the unreliability of close others displayed more attachment to objects than participants primed with the unreliability of strangers and that the relationship between the unreliability of close others prime and object attachment was mediated by attachment anxiety. In a follow-up study, Keefer (2016) found that dispositional anthropomorphism predicted the sense of security participants felt after being reminded of a material possession. Lastly, Medard and Kellett (2014) found anxious attachment to be associated with greater self-reported hoarding tendencies. These studies suggest that perhaps due to their inherent availability, objects may provide a viable sense of security for insecurely attached individuals.

Avoidantly attached individuals may prefer objects in their non-social state, whereas anxiously attached individuals may anthropomorphize objects to establish social proximity. In this paper, we sought to conduct the first systematic review of literature on insecure attachment styles and anthropomorphism. We focused on the anthropomorphism of objects (rather than deities or living non-human

entities) in this paper, as ultimately, we were interested in learning more about the mechanisms underlying strong object attachment in hoarding disorder. First, we examined how attachment styles and anthropomorphism, as well as how related situational and dispositional factors, have been assessed. We then looked for relationships among these constructs. Based on theoretical considerations, we expected that anxious attachment, but not avoidant attachment, would be positively related to anthropomorphism.

## 2. Method

### 2.1. Search procedures and selection criteria

A systematic review of the literature was conducted using guidelines informed by Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher, Liberati, Tetzlaff, Altman, and the Prisma Group, 2009). The literature search was conducted using eight online databases (PsycINFO, PubMed, MEDLINE, Scopus, Cochrane Library, ERIC ProQuest, PsycEXTRA and Google Scholar) to identify relevant full-text articles published in English between January 1997 and July 2017. ERIC ProQuest, PsycEXTRA, and Google Scholar were used to identify grey literature (unpublished research or research published in a non-commercial form). Key search terms were (‘attachment’ OR ‘attachment anxiety’ OR ‘attachment avoidance’ OR ‘insecure attachment’ OR ‘dismissing attachment’ OR ‘pre\*occupied attachment’ OR ‘fearful attachment’) AND (‘anthropomorphism’). Only studies with adult samples (over 18) were chosen. Reference lists were further assessed for additional, relevant papers. The search identified 1093 records, 71 of which were duplicates. Of the 1022 available records, review of the titles and abstracts revealed that 992 papers were not eligible. Two authors independently assessed the remaining 30 full-text papers for eligibility, and discrepancies were addressed via discussion.

Studies were eligible if they: (a) assessed insecure attachment style/s (attachment anxiety and/or attachment avoidance and/or fearful, dismissing, pre-occupied attachment); (b) assessed anthropomorphism of non-living entities; (c) presented original data; (d) contained sufficient data for computing effect sizes; and (e) had been written in English. Studies were excluded if they: (a) assessed anthropomorphism of living entities; or (b) assessed anthropomorphism of religious or spiritual deities. Six papers were eligible for inclusion. Fig. 1 presents the PRISMA flowchart. Included studies had between 101 and 367 participants, the majority of which were young females (see Table 1).

### 2.2. Data extraction

Two authors independently extracted data from eligible studies and entered the data into a structured Excel spreadsheet. The variables extracted from each study included: sample characteristics (sample size, proportion female, age), measures (attachment style investigated, attachment style measure, type of non-living entity, personal or novel object, anthropomorphism measure or manipulation, other primary measures, secondary measures), outcomes (outcome measure type, main outcome effect, other primary outcome effect(s), and other secondary outcome effect(s)). The two authors resolved extraction discrepancies through discussion.

### 2.3. Quality assessment

The methodological quality of studies was critically appraised by two authors using Kmet, Lee, and Cook’s (2004) Checklist for Assessing the Quality of Quantitative Studies. This quality assessment tool from the Standard Quality Assessment Criteria for Evaluating Primary Research Papers was chosen because it allows for variability in experimental designs (Kmet et al., 2004) and has been used in over 400 reviews in Google Scholar. The tool utilized a three-point coding system (no = 0, partial = 1, and yes = 2). Three of the 14 criteria (random

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