



A Multispecies Approach to Co-Sleeping

Integrating Human-Animal Co-Sleeping Practices into Our Understanding of Human Sleep

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Abstract Human sleeping arrangements have evolved over time and differ across cultures. The majority of adults share their bed at one time or another with a partner or child, and many also sleep with pets. In fact, around half of dog and cat owners report sharing a bed or bedroom with their pet(s). However, interspecies co-sleeping has been trivialized in the literature relative to interpersonal or human-human co-sleeping, receiving little attention from an interdisciplinary psychological perspective. In this paper, we provide a historical outline of the “civilizing process” that has led to current sociocultural conceptions of sleep as an individual, private function crucial for the functioning of society and the health of individuals. We identify similar historical processes at work in the formation of contemporary constructions of socially normative sleeping arrangements for humans and animals. Importantly, since previous examinations of co-sleeping practices have anthropocentrically framed this topic, the result is an incomplete understanding of co-sleeping practices. By using dogs as an exemplar of human-animal co-sleeping, and comparing human-canine sleeping with adult-child co-sleeping, we determine that both forms of co-sleeping share common factors for establishment and maintenance, and often result in similar benefits and drawbacks. We propose that human-animal and adult-child co-sleeping should be approached as legitimate and socially relevant forms of co-sleeping, and we recommend that co-sleeping be approached broadly as a social practice involving relations with humans and other animals. Because our proposition is speculative and derived from canine-centric data, we recommend ongoing theoretical refinement grounded in empirical research addressing co-sleeping between humans and multiple animal species.

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The relationship between humans and other animals has a long history. Since the domestication and socialization of animals in the late Pleistocene (~12,000 years BP), animals have been recognized across various cultures for their ability to aid human survival, health, and healing (Thompson and Smith 2014; Walsh 2009). Domestic dogs (*Canis familiaris*), in particular, have lived alongside humans for at least this long and are considered one of the most successfully adapted human-domesticated animals (Clutton-Brock 1999; Frantz et al. 2016; Larson et al. 2012; Vilà et al. 1997). Present-day Western and modern industrialized societies show consistently high levels of pet ownership. In Australia, for example, almost two thirds of households contain a pet (Australian Companion Animal Council 2010). Strong psychological attachment to pets is also common (Archer 1997) and for some, the relationship with their pet may supplement or even supplant interpersonal relationships (Veevers 1985). Recently, investigations into the sleeping behavior of pet owners has revealed that pets play a significant role in the sleeping lives of their owners as they do in their waking lives (Smith et al. 2014; Thompson and Smith 2014). Allowing animals to live inside the home, as well as to share the private space of the bed and/or bedroom, highlights the value and status that is bestowed on them. Around half of pet owners (predominantly of dogs and cats) share their bedroom or bed with their pet(s) during the night (Shepard 2002; Smith et al. 2014; Thompson and Smith 2014). Although human-animal co-sleeping is not a new phenomenon, what we know about the practice of co-sleeping is limited to studies of human adults, or parent-child co-sleeping arrangements. This has led to an incomplete and anthropocentric understanding of co-sleeping.

In this review, we discuss interpersonal and interspecies co-sleeping in parallel, with a focus on humans sleeping with dogs. Given the similarities between adult-infant and human-dog sleeping, we propose that human-animal co-sleeping deserves greater academic consideration. By approaching co-sleeping broadly as a social practice involving human relations with other human and non-human animals, we respond to a call for a greater understanding of the variable manifestations and meanings of sleep (Williams et al. 2010). Moreover, a comprehensive understanding of human-animal co-sleeping has significant practical implications for human sleep, human-animal relations, and animal welfare.

Background

Defining Co-Sleeping

Definitions of “co-sleeping” or “bed sharing” usually infer human partners sharing a bed, or parents and children sharing a bed or bedroom (Ball 2006; Dittami et al. 2007; Goldberg and Keller 2007; McKenna and Volpe 2007). Goldberg and Keller define parent-infant co-sleeping as when both are “in close enough proximity to exchange at least two sensory stimuli, such as touch, smell, movement, sight and/or sound” (2007:459). Moreover, co-sleeping need not occur for the entire night, but rather, any

portion of the night (Ball 2002). Although definitions vary, they fail routinely to include non-human animals. In this review, we advocate an extension of the definition of human co-sleeping to include sharing beds or rooms with animals.

The Evolution of Co-Sleeping

The sleeping body is considerably vulnerable (Hislop 2007; Williams and Crossley 2008). As a result, individuals may only allow people into their home or bed whom they trust (Ekirch 2001; Williams and Crossley 2008; Worthman and Melby 2002). With the exception of beliefs around out-of-body and numinous experiences (McCaul 2008), the sleeping body is typically thought of as non-relational and involuntary. However, co-sleeping arrangements require negotiation between dysfunctions or conflicts and the perceived social and psychological benefits (Meadows 2005; Williams et al. 2010). From this perspective, sleep can be approached as the interaction of individual biological requirements and shared social experience (Meadows et al. 2008). Co-sleeping, however, extends beyond interpersonal relationships, with the addition of non-human animals into human sleep practices. This has the potential to provide valuable insight about human co-sleeping practices, the social dimensions of sleep, and interspecies relations.

Sleeping arrangements have evolved over time and across cultures. In medieval European society—spanning the fifth to fifteenth centuries—for instance, sleep was a public and communal affair in which it was not uncommon to receive visitors in the bedroom, or for many people to sleep in the same bed (Arber et al. 2012). During this period, it was also customary to share a bed with passing travelers and for students attending boarding schools to share beds (Crook 2008). Sleeping with others was viewed by some as a way to increase personal security (Worthman and Brown 2007), conserve resources, and generate warmth (Ekirch 2001). By the fifteenth to seventeenth centuries in the British Isles, household beds became increasingly important, and represented significant assets that were reserved for those with the means to afford them. Parents most likely slept apart from children other than infants, although occasionally, entire households of European peasants shared the same beds (Ekirch 2001, 2006).

In contemporary Western or industrialized cultures, however, sleep is commonly regarded as an individual and private experience in which the body and mind are able to optimally rest and recuperate (Williams et al. 2010). This normative shift from sleep as a public and social affair to a private one arose through a complex “civilizing” process (Elias 1929). During the Victorian era (1837–1901), a domestic ideology emerged which questioned the established practice of a single bedroom sheltering multiple sleeping bodies, often from different families. In some circumstances, limitations on available bedchambers forced all family members to share a single bed (Crook 2008). This raised concerns about interfamily promiscuity and the even greater “moral evil” of incest (Crook 2008). Given this context, social norms and rules began to dictate that each person should sleep in a single bed, in a private place away from public view, and wearing appropriate sleeping attire, gradually introducing the concept of the private bedroom and private sleep to many social classes (Arber et al. 2012).

The emergence of the individual sleeping space was increasingly viewed as an indicator of wealth and prosperity in many Western industrialized societies, and private sleeping arrangements became sought after as a symbol of prestige (Blunden et al.

2011; Crook 2008; Ekirch 2001). Modern medical and scientific understanding further normalized private sleep spaces by identifying aspects of parent-child co-sleeping as risk factors for Sudden Infant Death Syndrome (SIDS), and by advocating that infants sleep in a separate space in the parents' bedroom (Moon 2011). Parents choosing to ignore this perspective and continue co-sleeping are sometimes viewed as negligent, rebellious, or selfish, which can produce feelings of embarrassment, shame, or stigma (Arber et al. 2012).

By privatizing sleep, the “civilizing” process introduced four general functions of sleep and the bedroom: (1) *Independence*, where privacy, autonomy, and personal control became normative dimensions of adult sleep (Arber et al. 2012); (2) *Health*, where the bedroom became a place for convalescence when injured or unwell (Crook 2008); (3) *Functionality*, where sleep has become more positively construed as fundamental for enhanced productivity and performance in everyday life; and (4) *Sexual relations*, where the increased number of bedrooms within a household enabled greater sexual segregation between children and their parents (Crook 2008). These four beneficial functions of sleep and the bedroom have been well researched in relation to interpersonal co-sleeping practices, with a focus on adult-adult and parent-child co-sleeping practices.

Adult-Adult Co-Sleeping

Decisions regarding sleeping partners vary greatly not only between cultures, but also within different social and cultural groups (Williams and Crossley 2008; Williams et al. 2010; Worthman and Brown 2007). For example, among the semi-nomadic Efé people, located in the Ituri rainforest of the Democratic Republic of Congo, virtually no individual sleeps alone (see Worthman and Melby 2002). It would not be uncommon for grandparents, two adults, and visitors to sleep together. Williams et al. (2010) note that the vast majority of adults in modern society do not sleep alone, particularly those in Western postindustrial populations. Moreover, choice of bed companions can mirror and strengthen social relationships and structure, and research has found that membership within a social unit partly determines with whom people choose to sleep (Worthman and Brown 2007).

Conversely, sleeping partners may generate conflict over different sleep requirements, differences in body temperature, as well as sleep behaviors such as snoring, restless legs, sleep-talking, and parasomnias (Hislop 2007; Meadows 2005). Despite these inconveniences, couples continue to co-sleep for reasons linked to social and physical intimacy, reassurance, companionship, mutual trust, vulnerability, and a culture of togetherness, particularly in contemporary Western societies (Hislop 2007; Williams et al. 2010). In one case presented by Meadows (2005), a male participant continued to sleep with his partner despite frequently disturbing her throughout the night or when she was ill. The participant argued that the intimate nature of co-sleeping was far more valuable than sleep quality. Meadows (2005) argues that although the closeness of sleeping together is a social product, psychological factors also impact adult co-sleeping.

Parent-Child Co-Sleeping

In Western cultures, parent-child co-sleeping is a highly contentious practice among parents and experts, fraught with confounding factors and definitional issues (Goldberg

and Keller 2007; McKenna and Volpe 2007; McKenna et al. 2007), health concerns, and taboo. Leading health and pediatric organizations advise against parents and children sharing a bed because of a positive correlation with Sudden Infant Death Syndrome (SIDS). Yet other experts in pediatric sleep, medicine, and breastfeeding strongly question these recommendations because of their impact on parenting beliefs, cultural values, and breastfeeding duration (Blunden et al. 2011; McKenna et al. 2007). They further argue that there are ways to mitigate bed-sharing risks, such as using appropriate bedding or having the child's and parents' beds in the same room (McKenna and McDade 2005; McKenna et al. 2007). Despite these opposing views, sleeping with children from birth remains the norm in many cultures, as has been observed in rural and urban Egypt (Worthman and Brown 2007) and indigenous cultures in unindustrialized populations (Blunden et al. 2011). Intergenerational co-sleeping is generally more prevalent in collectivist Asian countries (Mindell et al. 2010) than in the more individualistic West (Ramos et al. 2007).

Human-Animal Co-Sleeping

Whilst co-sleeping practices of adult-adult and parent-child arrangements have been well researched (as previously outlined), sleeping or sharing a bed with animals has been relatively ignored. Yet sleeping with, or alongside, animals is not novel. Early anthropological accounts of “traditional” cultures that mention co-sleeping with animals tend to emphasize the benefits of human-animal co-sleeping. In particular, dogs seem to serve a protective purpose. Aboriginal Australians, for instance, were often reported to sleep alongside their dogs (and/or dingoes) for warmth and for protection from evil spirits (Smith and Litchfield 2009). Indeed, the reference to a “three dog night”—a night so cold, it takes sleeping with three dogs to keep warm—has since become an Australian colloquialism (Smith and Litchfield 2009; Thompson and Smith 2014). Gabra herders in northern Kenya have also been observed to sleep in close proximity to their watchdogs tasked with driving off predators and alerting them to stock raiders (Worthman and Melby 2002). In preindustrial England, dogs were placed outside the sleeping quarters to guard the occupants and alleviate security-related anxieties (Ekirch 2001). During this time cats were often given free range within the sleeping quarters to help keep pests, such as rodents, at bay (Ekirch 2001). It was also not uncommon for families throughout the British Isles to bring farm animals into their sleeping quarters. This allowed for the protection of cows, sheep, and other livestock from predators and thieves and also provided additional warmth (Ekirch 2001, 2006).

In a cross-cultural study of human-pet dynamics across 60 (non-Western) societies, Gray and Young (2011) found that pet ownership practices, and the species kept, differed. This was evident in feeding practices, positive interactions with pets (e.g., grooming, playing), negative interactions with pets (e.g., killed to be eaten, physical abuse), and in the sleeping location of these animals: outside, inside, away from people, or near people). Dogs, the most commonly kept pets in 53 of the 60 societies, and cats, were about as equally likely to be reported sleeping outside, inside away from people, or inside near people. Of the 53 societies in which dogs were kept as pets, seven allowed them indoors. In only six of the societies did dogs have “nocturnal sleeping arrangements” both within the home and near people. Cats were permitted indoors at night around people in only two cultures. The findings from this cross-cultural study

suggest that co-sleeping with animals was historically uncommon. This research also proposed that the dotting on pets apparent in modern Western cultures—including co-sleeping practices—is a cross-cultural aberration, albeit one that has spread widely in recent decades (Gray and Young 2011). Although pet ownership in contemporary industrialized countries is quite common, the prevalence and reasons for the practice of human-animal co-sleeping are not well understood. As with parent-infant co-sleeping, pet owners appear divided in their decision to co-sleep. Various cross-sectional research conducted by media groups, the pet care and pet food industries, and predominantly from non-dedicated or non-validated surveys, suggests that approximately one in two pet owners share their beds or bedroom with their pets (Duthuluru et al. 2014; Shepard 2002; Thompson and Smith 2014).

Whilst little to nothing has been written about the impact of the “civilizing” process on human-animal co-sleeping, the same four general functions of sleep and the bedroom described above can also be observed in social proscriptions or taboos around human-animal co-sleeping. That is, sleeping independently from animals could be seen as a part of this “civilizing” process that: (1) distinguishes human behavior from more “animal-like” behaviors; (2) reduces the risk of contracting zoonotic diseases—recall the phrase, “If you lie down with dogs, you get up with fleas”; (3) enables the higher-quality sleep required to effectively contribute to society during waking hours; and (4) avoids inappropriate sexual contact with animals (see point 1). Overall, these functions discouraging human-animal co-sleeping can be related to the enforcement of a demarcation between human culture and animal nature (Ortner 1974). However, the need for—and implications of—prioritizing human culture over animal nature are being increasingly challenged, as evidenced in environmental movements, animal-welfare-and rights-based social action, psychological investigations into humans’ “creatureliness” (Beatson and Halloran 2007), and sustained research interest regarding potential benefits of human-animal relations.

Disincentives for Human-Animal Co-Sleeping

Current perspectives view both human-animal co-sleeping and interpersonal co-sleeping (e.g., parent-child) with the same apprehensions and tend to focus on the negative aspects or consequences of human animal co-sleeping (e.g., Smith et al. 2014; Thompson and Smith 2014). The following section explores these concerns. The parallels between child and animal co-sleeping behavior can be grouped into four overarching concerns: (1) health, (2) impaired functioning, (3) avoiding the development of problematic behaviors, and (4) sexual dysfunction.

Health Concerns

Co-sleeping with infants remains a controversial topic primarily because of its links with infant injury and mortality since bed sharing is an identified risk factor associated with SIDS. In addition, bed-sharing infants are more prone to sleep accidents, including being crushed by a parent, resulting in entrapment and suffocation. This finding is still debated as other factors, such as parental smoking, drug and alcohol use, bedding used, and overcrowding, are greater risk factors and confound some reported results

(Goldberg and Keller 2007; McKenna and McDade 2005; McKenna et al. 2007). As a result, several major health and parent organizations, including the American Academy of Pediatrics, strongly discourage bed sharing because of this potential risk, resulting in many Western parents now avoiding the practice. However, co-sleeping is often referred to only as bed sharing (Thoman 2006) whereas co-sleeping actually also includes room sharing, creating confusion for parents and a fear and avoidance of co-sleeping more broadly. A number of parent and health organizations advocate for room sharing in the first 6–12 months of life, as this has been found to reduce the risk of SIDS (McKenna and McDade 2005; McKenna et al. 2007). Consequently, discourse regarding parent-child co-sleeping remains convoluted, contradictory, and confusing, with the result that some parents generally avoid co-sleeping. Parents who choose to co-sleep may be viewed by some people as neglectful of their child's safety (Arber et al. 2012).

Although SIDS is not an explicit concern when considering human-animal co-sleeping, the practice of co-sleeping with animals can be perceived as controversial for other issues, such as those relating to the transmission of zoonotic diseases. Zoonoses are a product of interaction between humans and domestic or wild animals, and exposure to certain diseases can be exacerbated by human-animal co-sleeping (Beck 1975; Love 2010). A series of recommendations aimed at preventing the spread of disease associated with animals from various North American veterinarian and public health organizations, concluded that sharing a bed with a dog was significantly associated with infections such as Chagas disease, Methicillin-resistant *Staphylococcus aureus* infections, *Capnocytophaga canimorsus*, and *Pasteurella* spp. (Chomel and Sun 2011). However, zoonotic infections acquired from sleeping with a pet are relatively uncommon (Chomel and Sun 2011; Herzog 2014), particularly if the animal is kept clean and receives regular veterinary attention (Smith 2012). Also, the aforementioned recommendations were based on very rare cases (Chomel and Sun 2011; Herzog 2014). On the other hand, whilst the focus of contracting zoonotic diseases primarily targets their transmission from animals to humans, two thirds of human diseases are zoonotic and can also infect animals (Cleaveland et al. 2001). Therefore, co-sleeping can impact not only the owner's health, but also the health of the pet. Apart from contracting zoonotic diseases, co-sleeping with pets is known to provoke allergies or asthma in some pet owners as allergens are commonly shed on animal fur, contributing to the view that having a dog in the bed is unhygienic (Plaut et al. 1996).

Impaired Functioning

Co-sleeping increases individual vulnerability to nightly disturbances that may impair daily functioning. In adult-adult co-sleeping, women are more likely than men to experience disturbances throughout the night (Dittami et al. 2007). Bed partners of individuals who experience sleep disorders, such as obstructive sleep apnea, frequently awaken throughout the night, resulting in decreased sleep efficiency (Beninati et al. 1999; Troxel et al. 2009). Research also suggests that children who co-sleep with parents have more nighttime awakenings, which may in turn impact the parents' functioning the next day (Keller and Goldberg 2004). Chronic and severe sleep disruption can leave parents vulnerable to depression, impaired physical health, increased stress, and reduced overall quality of life (Sadeh et al. 2011; Richard et al. 1998). Children may also suffer the consequences of ongoing disrupted sleep, including

compromised maturation, affect regulation, memory consolidation, and learning, as well as impacts on cognitive functioning and behavior regulation (Sadeh 2007).

Severe sleep disturbance resulting from sharing a bed has the potential to impair daytime functioning and well-being. However, less severe disturbances consisting of fewer awakenings or shorter disruptions (see Keller and Goldberg 2004) may not be enough to cause significant daytime impairment. This suggests that the number of wakings itself is unlikely to be a suitable indicator of impaired daytime functioning specifically associated with co-sleeping. Finally, it is likely that co-sleeping parents are more aware of their children's nighttime disturbances because they are in closer proximity to their child throughout the night (Ramos et al. 2007). This also suggests that nighttime awakenings might be underreported for non-co-sleeping infants.

However, not all awakenings are negative. For example, McKenna and Gettler (2016) describe the practice of “breastsleeping” and argue that awakenings while co-sleeping are actually healthy and normal for breast-feeding. Further, differences may exist between human-human and human-pet attachment relating to ongoing physiological regulation (for example, physiological regulatory effects such as heart rate, breathing rate, body temperature, blood pressure) that underlies sleep disturbances or fragmentation. Thus, disturbances can be viewed as a means of resetting or correcting heart perturbations, aiding in oxygenation, and partner-induced arousals can lead to healthier infant sleep, sensory-based—transient and epochal—arousals and engagements. Since solitary sleep in sensory-deprived environments pushes infants into deeper sleep stages, it can decrease the likelihood of infants arousing to terminate apneic episodes and reinitiate breathing (see McKenna and McDade 2005). It would clearly be worthwhile to improve our understanding of these mutual regulatory processes between adults and pets, in comparison with adults and adults, and adults and infants.

Undoubtedly, the presence of an animal in the bed or bedroom may negatively impact sleep quality and quantity. One point of difference, however, is that although co-sleeping with children may create sleep disturbances that impair daily functioning of both parent and infant, human-animal co-sleeping disruptions are most likely to affect only the functioning of the pet owners (Smith et al. 2014). In a survey of Australian sleeping practices, Smith et al. (2014) compared owners who co-slept with their pets (10%) with those choosing not to. In age- and gender-matched comparisons, disregarding ownership status and pet species, results suggested that co-sleeping with pets negatively impacted sleep latency and quality. Consequently, owners sharing a bed with their pet took longer to get to sleep, were more likely to feel tired upon waking, and were more likely to report sleep disturbances from animal noises throughout the night than were those who did not share their bed with their pet. Yet, these findings regarding the link between co-sleeping and sleep quality were limited in scope, as data did not reveal the location of the pet in room, the species of pet, the exact impact of a pet on sleep latency, the sources of animal noises disrupting sleep, or whether disturbances were considered problematic by owners (Smith et al. 2014).

In an American study of pet-owner co-sleeping by Duthuluru et al. (2014) similar findings were reported: almost a third of pet owners who co-slept ($n = 148$) reported being awakened by the pet at least once per night, and those who co-slept more than four nights per week also reported poorer sleep quality. These figures are comparable to those in studies of parent-infant co-sleeping (Goldberg and Keller 2007). Sleep disturbances arising from human-animal co-sleeping may also be related to mismatched sleep

cycles (Campbell and Tobler 1984). In particular, dogs sleep polyphasically, averaging three sleep/wake episodes per nighttime hour, with active sleep immediately preceding spontaneous arousals that may conflict with the monophasic sleep/wake cycles of humans (Adams and Johnson 1994; Smith et al. 2014). Furthermore, Adams and Johnson (1994) found that regardless of a dog's sleeping state, whether they are in active or quiet sleep, they remain responsive to auditory stimuli, particularly barking. Unfortunately, without objectively measuring sleep quality in these co-sleeping arrangements—such as through simultaneous actigraphic and accelerometric measurement of pet and owner sleep—determining the physiological impact of such sleep disruptions is problematic.

Problematic Behaviors

Parent-child co-sleeping has been reported to produce undesirable behaviors in children, including bedtime resistance (Lozoff et al. 1984; Mandansky and Edelbrock 1990) and dependency (Brazelton 1992; Ferber 1985). Since the privatization of sleep in Victorian times, co-sleeping has been viewed by some as an indulgence that “spoils” and may lead to “lazy” and recalcitrant children (Jenni and O'Connor 2005). Co-sleeping children may exhibit abnormal psychological dependency and display separation anxiety when separated from their parents during the day (Morelli et al. 1992). Parents have reported that parent-child co-sleeping is related to sleep problems that promote maladaptive sleep-onset associations and habits that are reliant on parent interaction (Mandansky and Edelbrock 1990; Mao et al. 2004; Mindell et al. 2010; Ramos et al. 2007). When mothers provide continuous bodily contact throughout waking and co-sleeping periods to reduce anxiety and tension, infants may begin to depend on their presence for emotional regulation and be more likely to experience profound distress when separated from the parent, both during the day and at night (Sadeh et al. 2010).

Importantly, arguments proposing that co-sleeping leads to negative effects are neither straightforward nor conclusive, particularly for human-infant dyads. Many studies detailing negative behavioral outcomes resulting from co-sleeping largely depend on whether the co-sleeping is a deliberate choice of the mother or is a reaction to another's behavior (“reactive co-sleeping”; e.g., Mandansky and Edelbrock 1990). The particular culture being studied should also be used to frame interpretations; co-sleeping is frequently discussed from the perspective of a Western, industrialized society (e.g., Mao et al. 2004), which does not necessarily reflect normative behavior worldwide (see McKenna et al. 2007). Indeed, several studies have reported positive outcomes from co-sleeping that may relate to both human-human and interspecies co-sleeping. For example, Keller and Goldberg (2004) note that children who sleep with their parents while young are in fact more self-reliant and exhibit more social independence, rather than the opposite. Heron (1994) also reported that children who were never permitted to share their beds were more fearful and more difficult to control than children who consistently slept in their parents' bed at night. Mosenkis (1998) found far more positive than negative adult outcomes for individuals who co-slept as a child, among multiple ethnic groups: African Americans and Puerto Ricans in New York and Puerto Ricans, Dominicans, and Mexicans in Chicago. Across all of these groups, co-sleepers exhibited greater feelings of satisfaction with life than did non-co-sleepers. The benefits may also extend to the mothers themselves; women who co-slept as children

had higher self-esteem than those who did not (Crawford 1994). Thus, co-sleeping, contrary to some opinion, may indeed promote confidence, self-esteem, and intimacy, possibly by reflecting an attitude of parental acceptance (Lewis and Janda 1988).

As with parent-infant co-sleeping, co-sleeping with animals may produce similar undesirable or dysfunctional behaviors in the pets as it does in infants. Dog owners are often advised that letting a dog sleep on the bed may “spoil” the dog and cause undesirable behaviors (Voith et al. 1992). Multiple sources suggest that allowing dogs into the bedroom may create competitive aggression, predominantly when attention is not paid to the dog, or the dog may become aggressive toward other dogs in the household (see Thompson and Smith 2014). For example, competitive aggression and separation-related elimination problems—such as urination and defecation—may be more prevalent among room-sharing dogs (Jagoe and Serpell 1996) and, conceivably, dog-owner co-sleeping might produce an “unbalanced” attachment, favoring a stronger attachment of the dog to the human, exacerbating adverse reactions to separation (Jagoe and Serpell 1996). Conversely, and as mentioned earlier, pets may be invited into the bedroom as a result of behavioral problems, such as scratching at doors or repetitive barking if excluded from the room (Thompson and Smith 2014). That implies that negative outcomes may exist independent of the co-sleeping arrangement, and that co-sleeping amplifies or perpetuates these issues within both children and pets. At present, it is difficult to determine directionality: whether behavioral problems are antecedents or consequents of co-sleeping arrangements.

Sexual Dysfunction

Parent-child co-sleeping may raise concerns involving sexuality in the bedroom, particularly as children get older. When the “civilizing” process increased segregation between children and their parents, it established and enforced “controlled” and “acceptable” infant-parent relationships (Blunden et al. 2011; Crook 2008). Co-sleeping can increase children’s proximity to auditory and visual exposure to adult sexual behavior and, as a result, has been labeled as one potential indicator of emotionally incestuous parenting, which may represent a perversion of childhood (Okami 1995; Thompson 2010). Some literature has even suggested that co-sleeping may promote abnormal attraction to the maternal caregiver, or convey messages of seduction to children who imitate adult sexualized behavior without adequately understanding the context (Okami 1995; Thompson 2010). Furthermore, co-sleeping can interfere with physical intimacy and sexual relationships between parents because of the child’s close proximity. Having this third person in the adult caregivers’ bed creates a distraction and a competitor for the concern, attention, and affection of one or both sexual partners (Stein et al. 1997). Parents who co-sleep with older children (5–9 years) report significantly higher level of marital distress than parents of solitary sleepers (Cortesi et al. 2008), which may be related to this reduced opportunity for intimacy.

Whilst this may be true, the argument for sexual dysfunction as a result of co-sleeping is somewhat tenuous. Germo et al. (2007) found no difference in overall adult relationship satisfaction between solitary sleeping, early co-sleeping, and reactive co-sleeping parents living with younger children. In a study of extended parental absence during employment rotation—with one partner in the military—children who co-slept, including older boys (≥ 3 years) who shared a bed with their mothers, exhibited few emotional

or behavioral problems and were even underrepresented in corresponding base psychiatric populations (Forbes et al. 1992). A longitudinal examination of bed-sharing effects on life cycle stages from infancy to 18 years of age concluded that sharing a bed in infancy and early childhood displayed no association with sleep problems, sexual pathologies, or any other problematic consequences (Okami et al. 2002). The authors concluded that when bed sharing is practiced safely, and as a part of valued family relational dynamics, the likelihood of harm was minimal (Okami et al. 2002).

Animals' presence in the bed or bedroom may interrupt normative sexual relations between bed partners, which could then act as a source of conflicts or issues regarding intimacy between couples, particularly if the pet is unwelcomed in the bed by one partner only (Thompson and Smith 2014). Co-sleeping alongside animals may also raise concerns of sexual acts involving pets (Miletski 2005). Although this practice has been evident throughout human history, its affiliation with unhealthy romantic attachments, socially aberrant sexual acts, and particularly its animal welfare implications support its illegality and low prevalence (Dekkers and Vincent 1994; Miletski 2005). There is, however, little reason to link zoophilia among pet owners as a prevalent and normative motivation for co-sleeping.

Motivations for Human-Animal Co-Sleeping

Despite the many apprehensions surrounding human-animal co-sleeping, its high incidence would suggest that its advantages likely outweigh any disadvantages. Despite potential negative repercussions of human-animal co-sleeping, approximately half of all animal owners appear to remain motivated to co-sleep with their pets, suggesting that there are likely benefits to continuing the practice. Clearly, co-sleeping with a pet considerably increases the time an owner spends proximate to the animal. Given that some studies have reported that pet ownership can provide a number of benefits to human physical, psychological, and social health (Crawford et al. 2006; Smith 2012), this suggests that co-sleeping may provide or enhance psychological benefits. Yet the opposite may hold true for some owners. For example, those who are lonely may be more likely to sleep with their pets, and whilst this may be comforting, an unhealthy pathological level of pathological attachment may ensue (see "[Attachment and Emotional Closeness](#)").

Our understanding of what motivates humans to share their bed with their pets is currently limited. However, motivations for parents choosing to co-sleep with children appear to be relatively well-established (Ball 2002). As in parent-infant co-sleeping, the decisions made by a pet owner about where their pet sleeps during the night are dependent upon philosophical, psychological, and cultural orientations, as well as emotional and practical factors (Smith et al. 2014). Given that there is likely to be some similarity with parent-child co-sleeping, the following section considers how motivations explaining adult-child co-sleeping may extend to human-animal co-sleeping.

Early Co-Sleepers and Reactive Co-Sleepers

Practical reasons, such as a lack of space, may account for the development of some parent-child co-sleeping arrangements (Germo et al. 2007); however, the decision is often a reflection of parenting strategies or philosophies. Two forms of parental co-

sleeping have been identified: early co-sleepers, and reactive co-sleepers (Keller and Goldberg 2004). Early co-sleeping parents plan to co-sleep from birth, or begin to do so within the first months of their child's life. These parents report a satisfaction with sleeping arrangements (Geramo et al. 2007) that appears to be congruent with parenting beliefs (Goldberg and Keller 2007). Reactive co-sleeping parents, however, use co-sleeping as a palliative response to nighttime sleep problems, including sleep-onset difficulty, frequent or prolonged night-waking, and intense crying. These parents tend to be dissatisfied with the sleeping arrangements (Geramo et al. 2007), to rate waking at night as significantly more problematic despite no significant difference in frequency compared with other co-sleeping families, practice more co-sleeping for part of the night only, and usually begin co-sleeping when the child is one year or older (Keller and Goldberg 2004).

Similar to early-co-sleeping parents, pet owners may have made the decision to co-sleep with their pet from the time of adoption. This could be due to a lack of alternative sleeping spaces, a conscious decision to be close and develop a strong relationship with the pet (as noted above), or in order to ease the animal's transition to the new household (e.g., adopted or very young animals). Reactive co-sleepers may also co-sleep with some pets but not with others, introducing them into the bed or bedroom to reduce specific problematic behaviors. For example, the pet may be more distracting when separated from their owner at night (Thompson and Smith 2014). Thus, the different antecedents and consequences for these two co-sleeping groups need to be considered separately, and they are in many cases applicable to human-animal co-sleeping as well. One major point of difference, however, is that co-sleeping with pets is typically an ongoing arrangement (i.e., for the life of the pet), whereas co-sleeping with children decreases as the child ages, and eventually terminates at maturation and separation.

Attachment and Emotional Closeness

There may also be symbolic, relational, and visceral explanations for these similarities and differences. For instance, parents who choose to co-sleep with children often regard the arrangement as a form of parent-child interaction, providing security and an opportunity for bonding time (Ball 2002; Welles-Nystrom 2005). Parents interviewed in one study often co-slept with their infant for practical reasons, such as breastfeeding and alleviating or managing sickness, or mitigating risk of SIDS, although reasons of psychological security were also offered (Ball 2002). Ball (2002) further proposed that co-sleeping could remove distancing effects felt by fathers and assist in increasing paternal involvement. Overall, co-sleeping with spouses and children has been regarded as protective, comforting, and vital to foundational relationships and emotional patterns of family life (Worthman and Brown 2007). As noted above, the social guidelines of who sleeps with whom reflects broader sociocultural values around belonging, identity, care, and intimacy.

Of additional note is an apparent link between infant sleep patterns and infant attachment status. McNamara et al. (2003) found that infants classified as insecure-avoidant exhibited significantly fewer night wakings (at 6 months) and shorter durations of night-waking episodes (at 15 months) relative to their insecure-resistant counterparts. Importantly, the relationship between sleep and early infant attachment also reflects certain unique features of early infant sensory and motor integration,

learning, communication, and motivation, as well as the regulation of biobehavioral systems by the maternal caregiving interactions (Hofer 2006).

In ways comparable to the aforementioned reasons humans co-sleep with romantic partners and children, pets can provide a source of comfort, companionship, and act as substitutes for human social support (Beck and Madresh 2008). For example, some dog owners consider their dog to be a member of the family, suggesting they should have the same rights and privileges as a family member (Brown 2002). Other pet owners may take this view a step further, perceiving their relationship with their dog as they do with children, and will often interact with their dog accordingly (Archer 1997; Belk 1996; Brown 2002; Veevers 1985). Interestingly, some dog owners choose to let their dog(s), but not their child/children, sleep on their bed. If animal owners view their pets as human substitutes, it makes some sense to regard human-animal co-sleeping as another social dimension of sleep. Unfortunately, no study has yet considered these potential motivations for co-sleeping; whether pet owners who currently co-sleep with their pet have previously done so, or currently co-sleep with their children; and the degree to which children and pets are comparable in this context.

Attachment theory might offer one explanation for why certain animal owners want to co-sleep with their pets: to remain “close,” feel secure, and avoid separation anxiety experienced by either the dog or owner (Archer 1997; Thompson and Smith 2014). In its original form, attachment theory explains interpersonal experiences of affectional ties between children and adults; however, it now also encompasses adult-adult relationships (Thompson and Smith 2014) and human-animal relationships (Beetz et al. 2012; Kurdek 2008). Animal owners frequently turn to their pets for social support in emotionally stressful situations (Kwong and Bartholomew 2011; Trigg et al. 2014, 2015, 2016).

Attachment behavior is often used to describe any form of behavior that results in a person attaining or maintaining proximity to a caregiver (or attachment figure) and is most apparent whenever the person is sick, fatigued, or frightened (Bowlby 1982). Essentially, attachment consists of two major, but separate, dimensions: *anxiety*, which consists of the individual worrying about the attachment figure being unavailable during times of distress, resulting in the person endeavoring to be close to them; and *avoidance*, where both emotional and behavioral independence from the attachment figure is sought and experiences of closeness and dependency are discomfiting (Kurdek 2009). Typically, when people cannot easily maintain contact with an attachment figure, characteristic attachment behaviors arise; separation anxiety, contact maintenance, and proximity seeking (Kurdek 2008; Zilcha-Mano et al. 2011, 2012). Thus, the role of attachment in co-sleeping behavior suggests that some humans may be unconsciously motivated to co-sleep with their pets in order to feel secure and avoid separation distress (Thompson and Smith 2014).

Indeed, there is preliminary evidence that dog owners who allow the animal to sleep in their bedroom exhibit higher global attachment to the dog than do those who ensure that their dog sleeps elsewhere (Martens et al. 2016). Whilst this interpretation of attachment theory, and of seeking emotional closeness, has the potential to explain human-animal co-sleeping, there is no universal consensus of what constitutes pet attachment. The degree of attachment between a dog and its owner depends on the owner’s needs and the dog’s personality and behavior (Brown 2002; Woodward and Bauer 2007). Zilcha-Mano et al. (2011) propose that pet owners’ different dispositions

or orientations influence the way they experience relationships with their pets, and that these differences contribute uniquely to the prediction of expectations about the pet and emotional reactions to their death. Further, attachment theory does not take into account individuals who feel securely attached or emotionally close to their dog yet feel no need or desire to share their bed with their dog. Nor does it consider owners who sleep with a dog because it is their partner's dog and choice, rather than for the reason that they themselves are securely attached to the dog (Smith et al. 2014; Thompson and Smith 2014).

Pets as “Extended Selves”

The idea that animals (primarily companion animals) can be viewed as “extended selves,” as proposed by Belk (1988, 1996) and later Brown (2007, 2011), provides a more phenomenological explanation for close relationships between humans and animals and offers one explanation for why people take risks for the animals in their care (Thompson 2013). That is, the relationship with a pet can be so important to the identity of some humans that pets might be best understood as special cases of extended human selves (Belk 1988). In a sense, the animal can be viewed as an extension or part of human self, wherein animals, analogous objects, money, other people, and so forth, can be used in defining and developing human identity. Likewise, Thompson and Smith (2014) propose that if a pet were considered an extension of a particular human, it would not be surprising if it accompanied that human self in sleep. In particular, owners who are unable to accompany their pets during the day might attempt to maximize contact and interaction through co-sleeping during the night. A similar explanation is provided by some working mothers when describing reasons for sharing a bed with their child at night. In this case, co-sleeping can account for lost time with their infants during the day, validate their maternal role, and ensure that their infants know that their mothers love them and want to be with them (McKenna and Volpe 2007).

Transitional Objects for Solo Sleeping Practices in Children

Thompson and Smith (2014) further suggest that pets can play a role as transitional objects (or subjects) to encourage independent sleeping practices among children who would otherwise seek comfort and security by sleeping in their parents' or siblings' bed (also see Triebenbacher 1998). The term originally applied to objects such as blankets and comforting toys to which children develop a strong attachment, but pets may also be perceived by children as “living security blankets,” helping to mediate the connection between the child's inner mind and outer reality (Lee 2008; Thompson and Smith 2014; Triebenbacher 1998). The pet is independent, because it has its own characteristics, but also becomes a part of the child as it takes on qualities projected by the child (Noonan 1998). Transitional objects hold particular importance to children because they provide the child with comfort and help alleviate anxiety or distress (Triebenbacher 1997). Consequently, in the role of transitional objects, pets may assist in the development of independent sleeping practices as they serve comfort and security functions that children would otherwise seek in parental interactions (Thompson and Smith 2014; Triebenbacher 1998).

Conclusion

Apart from its clear reproductive function for the survival of the species, as well as physiological support for the quality and quantity of sleep that are essential to individual health and well-being, co-sleeping fulfils basic psychological needs and reinforces and maintains social relations. Throughout history, humans have shared their sleeping spaces with other humans and other animals. However, the study of co-sleeping practices is anthropocentrically framed: it is heavily biased toward interpersonal co-sleeping to the neglect of interspecies co-sleeping. The result is an incomplete understanding of overall co-sleeping practices.

In the absence of targeted experimental research into motivations for human-animal co-sleeping, this review has identified potential explanations through existing theories of adult-child co-sleeping. Empirical research is required to determine how the concepts of early co-sleepers, reactive co-sleepers, attachment, emotional closeness, extended self, and transitional objects apply to human-animal sleeping. Where existing theories do seem to accommodate human-animal sleeping, there is a further need to determine in what ways, under what circumstances, and what precisely they might contribute to human society and development.

Existing theories and concepts need to be adapted or redefined to accommodate some important differences between adult-child and human-animal co-sleeping. For example, whereas co-sleeping with a child characterizes the early developmental stages of adult-child relations, co-sleeping with a pet is likely to occur for the life of the pet. In a household of pets, partners, and children, animal bedfellows often remain after other humans have left. Finally, since our propositions are based on canine-centric research, we also recommend detailed examination of human co-sleeping with other animal species, particularly cats, but also less conventional species. Given that sleep accounts for a large portion of human and animal life, and that interspecies co-sleeping impacts humans, animals, interpersonal relations, and interspecies relations, there is an urgent need for researchers to truly contemplate “who’s been sleeping in your bed?”

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