The Possible Role of Companion-Animal Anthropomorphism and Social Support in the Physical and Psychological Health of Dog Guardians

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Abstract
While previous research suggests that individuals who humanize their companion animals may have insufficient human social support (Epley, Waytz, & Cacioppo, 2007), researchers have not examined the relation between companion-animal anthropomorphism and the health of animal guardians while taking into consideration their human social support levels. It was hypothesized that dog guardians with low levels of human social support would have poorer health if they engaged in high rather than low levels of anthropomorphism, while the health of dog guardians with high levels of human social support would not vary depending on their anthropomorphism levels. A sample of 203 Canadian dog guardians completed an online survey. Results revealed that, among dog guardians with low levels of human social support, those who engaged in high levels of anthropomorphism were more depressed, visited the doctor more often, and took more medications. Furthermore, among dog guardians with high levels of human social support, those who engaged in high levels of anthropomorphism were more stressed and depressed. These findings highlight the complexity of the relationship between anthropomorphic behavior, human social support, and dog guardians' health.

Keywords
anthropomorphism, dogs, physical health, psychological health, social support

According to the American Pet Products Manufacturers Association (APPMA), the amount of money Americans spent on their companion animals doubled from $21 billion in 1996 to $41 billion in 2007 (American Pet Products Manufacturers Association, 2008). The APPMA states that this increase is partly due to the increased pampering of companion animals, which has resulted in a multitude of new services and products being provided to their human guardians. Many of these services cater to anthropomorphic behavior, which has been defined as “the attribution of human states (thoughts, feelings, motivations and beliefs) to nonhuman animals” (Serpell,
Dog guardians who take their dog with them while traveling can now stay at hotel chains that provide dog guests with amenities such as check-in gift packages, luxury beds, doggie robes, turn-down treats, and room service (American Pet Products Manufacturers Association, 2008; Loews Hotels, 2008). Rather than leaving their dog in a kennel while they are away, dog guardians can check their dog into a “pet hotel” with a luxury suite containing a cot, a lambskin blanket, and entertainment in the form of a television showing pet-themed shows (PetSmart PetsHotel, 2008). Finally, there is also an ever-increasing number of products for dogs, such as edible dog cards, birthday cakes, pawlish (nail polish), colognes, and a wide range of clothing (Glamour Dog, 2008; Harley Davidson Gear, 2008; Old Navy, 2008; Pressies 4 Dogs, 2008). Taken together, this body of research clearly indicates that human-animal interactions are changing and companion animals may be taking on a more significant role in our lives. The relationship between humans and their companion animals is bearing more resemblance to that between humans, with the role of companion animals involving strong anthropomorphic attributions.

Veevers (1985) argues that human-animal interactions may act as a substitute for human-human interactions and identifies a need to explore the circumstances in which companion animals can satisfactorily substitute for human companionship. Albert and Bulcroft (1988) identify certain categories of people (those in second or subsequent marriages, divorced, never married, or childless) who are likely to engage in high levels of companion-animal anthropomorphism. They suggest that these individuals may be using their companion animals as emotional substitutes for family members, such as spouses and children. Epley, Waytz, and Cacioppo (2007) suggest that individuals who feel lonely are more likely to engage in anthropomorphism in an attempt to satisfy their need for social connection. Further evidence is provided by two recent studies, which found that undergraduates who were induced to feel lonely (Epley, Akalis, Waytz, & Cacioppo, 2008a) or reported high levels of loneliness (Epley, Waytz, Akalis, & Cacioppo, 2008b) were more likely than undergraduates who were not induced to feel lonely or who had low levels of loneliness to select supportive anthropomorphic traits (e.g., companion animal is thoughtful, considerate, or sympathetic) when asked to describe their companion animal or a companion animal whom they knew well. Finally, a recent study by Duvall Antonacopoulos and Pychyl (2008) found that, among dog guardians, there was a negative relation between anthropomorphism and perceived levels of human social support. Taken together, these studies suggest that individuals who engage in high levels of companion-animal anthropomorphism may be doing so in an attempt to compensate for insufficient human social support.
Only one study has examined the relation between anthropomorphism and health. Duvall Antonacopoulos and Pychyl (2008) found a positive relation between anthropomorphism and stress. This study did not, however, consider the possibility that this relation varied depending on human social support levels. Given that researchers have found that the more human social support individuals have, the better their physical health (Friedmann & Thomas, 1995; House, Landis, & Umberson, 1988; Berkman & Syme, 1979) and psychological well-being (Budge, Spicer, Jones, & St. George, 1998; Ross & Van Willigen, 1997; Winefield, Winefield, & Tiggemann, 1992), it may be that dog guardians’ health is affected by both their anthropomorphism and human social support levels. We speculate that, among dog guardians with low levels of human social support, those who engage in high levels of anthropomorphism may have unrealistic expectations about the ability of their dog to compensate for their lack of human social support. These dog guardians may become frustrated and experience negative health consequences when their dog is unable to provide the same social support that is available from human-human relationships. On the other hand, dog guardians who lack human social support but do not use their dog to try to fill this void by humanizing him/her may not experience the same negative health consequences as those who engage in high levels of anthropomorphism. Among dog guardians who have high levels of human social support, the extent to which they humanize their dog may not have an impact on their well-being, given that they have other sources of social support. We hypothesized, therefore, that the physical and psychological health of dog guardians who have low levels of human social support would be poorer if they engage in high rather than low levels of anthropomorphism while, among dog guardians with high levels of human social support, physical and psychological health would not vary according to anthropomorphism levels.

Method

Participants

Participants were invited to take part in a ten-minute online survey of “factors affecting the well-being of dog owners.” The survey was placed online using “Survey Monkey,” a tool designed to create and customize online surveys (http://www.surveymonkey.com/). It should be noted that, prior to data collection, permission to conduct this survey was granted by the Carleton University Ethics Committee for Psychological Research. Participants were recruited first through snowball sampling by sending an e-mail containing
information about the survey to family and friends, who were asked to forward the e-mail to others, and second through ads placed in community newspapers and on Facebook. Participants were asked where they lived in order to restrict the sample to residents of Canada. In addition, given that cat companionship, like dog companionship, is beneficial for human health (Headey & Grabka, 2007), participants who had both dog and cat companions were excluded.

The sample was comprised of 203 dog guardians (183 females, 20 males) who ranged in age from 18 to 62 ($M = 37.79$, $SD = 10.41$). Participants’ marital status included married (41.9%, $n = 85$), single (24.6%, $n = 50$), common-law¹ (20.2%, $n = 41$), divorced (6.4%, $n = 13$), cohabitating (3.4%, $n = 7$), separated (2.5%, $n = 5$), and widowed (1%, $n = 2$). Participants’ level of education included some high school (5.4%, $n = 11$), finished high school (14.3%, $n = 29$), some college² (20.7%, $n = 42$), completed college (22.7%, $n = 46$), some university (9.9%, $n = 20$), one university degree (14.3%, $n = 29$), and two or more university degrees (12.8%, $n = 26$). Participants’ income before tax included less than $20,000 (13.8%, $n = 27$), $20,000 to $34,999 (18.4%, $n = 36$), $35,000 to $49,999 (26.5%, $n = 52$), $50,000 to $64,999 (11.7%, $n = 23$), $65,000 to $79,999 (14.8%, $n = 29$), and $80,000 or above (14.8%, $n = 29$). In response to a question asking whether participants lived alone, the overwhelming majority of participants (85.9%, $n = 171$) indicated that they did not live alone. Finally, to ensure that the sample did not include a disproportionate number of students, participants were asked to indicate whether they were full-time college or university students. The overwhelming majority of participants indicated that they were not students (92.6%, $n = 188$).

Materials

Dog guardians completed a questionnaire package containing measures of their demographic characteristics (sex, age, marital status, education, income before tax, whether they lived with other people, and whether they were a student), anthropomorphism levels, human social support levels, physical and psychological health, and additional measures known to influence physical and psychological health.

Independent Variables

In order to assess the extent to which dog guardians anthropomorphize their dog, Albert and Bulcroft’s (1988) 10-item anthropomorphism scale was used. The scale ranges from 1 (describes me exactly) to 5 (does not describe me) and
includes items such as “I celebrate my dog’s birthday.” Albert and Bulcroft (1988) found that Cronbach’s alpha was .69. In the present study, two additional items were added. The first item, which asked participants whether they confide in their companion animal, was added based on the work of Voith, Wright, and Danneman (1992), who identified confiding in companion animals as a measure of anthropomorphic attitudes. The second item, which asked participants whether they dress their dog, was included, as other researchers have noted that this is another way in which dogs are humanized (Greenebaum, 2004; Archer, 1997; Hirschman, 1994). In an earlier study that we conducted with dog guardians using the 12-item anthropomorphism scale, we found that Cronbach’s alpha was .85 (Duvall Antonacopoulos & Pychyl, 2008). In the present study, Cronbach’s alpha was .81. Evidence for the concurrent validity of the scale is provided by the fact that, as expected, Albert and Bulcroft (1988) found a positive relation between anthropomorphism and attachment to companion animals, $r = .69$.

The 12-item Multidimensional Scale of Perceived Social Support (MSPSS) developed by Zimet, Dahlem, Zimet, and Farley (1988) was used to examine participants’ overall levels of perceived human social support. The scale ranges from 1 (very strongly disagree) to 7 (very strongly agree) and includes items such as “I can talk about my problems with my friends.” According to Zimet et al. (1988), the scale is internally consistent, as assessed by Cronbach’s alpha ($\alpha = .88$), and has adequate test-retest reliability after two to three months ($r = .85$). Item analyses conducted for the present study revealed that Cronbach’s alpha was .93. According to Zimet et al. (1988) the scale has moderate construct validity, as reflected by negative correlations between the MSPSS and the depression and anxiety subscales of the Hopkins Symptom Checklist.

**Dependent Variables**

To assess physical health, participants indicated how many times they had visited any type of medical doctor in the past year, reported how many prescription medications they had taken in the past month (excluding birth control pills), and rated their health on a scale ranging from 0 (poor) to 4 (excellent).

To assess psychological health, participants completed measures of their levels of stress and depression. First, Cohen, Kamarack, and Meremsterlin’s (1983) 14-item Perceived Stress Scale (PSS) was used to assess how often, in the past month, participants felt that their lives were unpredictable, uncontrollable, and overloaded. The scale ranges from 0 (never) to 4 (very often) and includes items such as “In the past month, how often have you felt difficulties were piling up so high that you could not overcome them?” When Cohen
et al. (1983) tested the PSS with college freshmen living in residence, college students in an introductory personality course, and individuals attending a community smoking cessation program, the scale was internally consistent ($\alpha = .84$, .85, and .86 for the three groups, respectively). In addition, the two-day test-retest reliability of the scale for college students living in residence was .85. In the current study, Cronbach’s alpha was .88. The PSS has predictive validity in that the PSS scores of college freshmen living in residence were positively correlated at .20 with their use of health centers over a five-week period (Cohen et al., 1983).

Second, Radloff’s (1977) 20-item Center for Epidemiological Studies-Depression Scale (CES-D) was used to examine how frequently participants experienced symptoms of depression during the past week. The scale ranges from 0 (rarely or none of the time [less than 1 day a week]) to 3 (most or all of the time [5-7 days a week]) and includes items such as “I had trouble keeping my mind on what I was doing.” The scale is internally consistent ($\alpha = .85$) and has modest test-retest correlations after two to twelve weeks; all but one test-retest correlation ranged between .45 to .70 (Radloff, 1977). Item analyses in the present study revealed that Cronbach’s alpha was .91. The CES-D Scale demonstrates concurrent validity, as reflected by its high correlation with the Beck Depression Inventory, $r = .86$ (Santor, Zuroff, Ramsay, Ceravantes, & Palacois, 1995).

**Additional measures**

Participants were asked to complete four additional measures of factors known to influence physical and psychological health. First, participants were asked to indicate how much time they spent engaged in physical activity on each of the last seven days, since researchers have found that increased levels of physical activity are associated with health benefits (Gilmour, 2007; U.S. Department of Health and Human Services, 1996). It should be noted that participants were asked only to include physical activity that they engaged in for a period of at least 10 minutes, given that, according to both Canada’s Physical Activity Guide to Healthy Active Living (Health Canada and the Canadian Society for Exercise Physiology, 1998) and the updated recommendations from the American College of Sports Medicine and the American Heart Association (Haskell et al., 2007), a minimum of 10 minutes of physical activity at each session is required to obtain health benefits.

Second, participants were asked to indicate how much time they spent in a natural environment (e.g., park, forest, countryside) on each of the last seven days, as researchers have found that being in a natural environment is beneficial for human health (Hull & Michael, 1995; Godbey, Graefe, &
James, 1992). Third, participants were asked to indicate how many years they have had their oldest dog, as researchers have suggested that as the number of years of dog companionship increases, human health improves (Cavanaugh, Leonard, & Scammon, 2008). Fourth, at the end of the PSS, participants were asked whether, in the past month, they had experienced a traumatic event, such as the death of a family member, given that experiencing a traumatic event may be detrimental to physical and psychological health.

Results

Analyses were conducted using a priori simple effects3 after controlling for the influence of covariates. Specifically, in all analyses, any demographic variables or additional measures (time in physical activity, time in nature, length of time of dog companionship, and traumatic event) that correlated significantly with the dependent variables assessing physical or psychological health were included as covariates in order to reduce error variance in the dependent variables. Demographic variables were dichotomized as follows: sex (female vs. male), marital status (single/separated/divorced/widowed vs. married/live with partner), education (no university vs. some university), income before tax (less than $35,000 vs. $35,000 or more)4 and live alone (yes vs. no). Age, however, was left as a continuous variable.

Prior to conducting these analyses, we verified that the assumptions for ANCOVA were satisfied and reduced the impact of outliers by assigning outliers a value that was one unit larger (or smaller) than the next most extreme score (Tabachnik & Fidell, 2007). The only exception was for the dependent variable, number of doctor visits, for which it was necessary to use a square root transformation in order to deal with the presence of outliers. It should be noted that in all analyses, higher scores reflect higher levels of anthropomorphism, higher levels of human social support, and poorer physical and psychological health.

Hypotheses were first examined with respect to physical health as assessed through doctor visits, prescription medications, and a subjective rating of health. With respect to doctor visits, as hypothesized, among dog guardians with low levels of human social support, dog guardians who engaged in high levels of anthropomorphism ($M = 2.17, SE = 0.15$) reported having significantly more doctor visits during the past year compared to dog guardians who engaged in low levels of anthropomorphism ($M = 1.59, SE = 0.15$), $F(1, 103) = 7.29, p < .01$, partial $\eta^2 = .066$. As hypothesized, among dog guardians with high levels of human social support, dog guardians’ number of doctor visits did not differ significantly, depending on whether they engaged in
low \((M = 1.89, SE = 0.14)\) or high \((M = 1.92, SE = 0.17)\) levels of anthropomorphism, \(F(1, 89) = 0.03, p > .05\), partial \(n^2 = .000\).

In terms of number of medications, consistent with our expectations, among dog guardians with low levels of human social support, after controlling for the amount of time dog guardians engaged in physical activity during the previous week, dog guardians who engaged in high levels of anthropomorphism \((M = 2.06, SE = 0.23)\) reported taking significantly more medications during the past month compared to dog guardians who engaged in low levels of anthropomorphism \((M = 0.87, SE = 0.22)\), \(F(1, 106) = 13.83, p < .001\), partial \(n^2 = .115\). As hypothesized, among dog guardians with high levels of human social support, after controlling for the amount of time dog guardians spent in nature during the previous week, dog guardians’ number of medications did not differ significantly depending on whether they engaged in low \((M = 1.00, SE = 0.16)\) or high \((M = 1.19, SE = 0.20)\) levels of anthropomorphism, \(F(1, 88) = 0.56, p > .05\), partial \(n^2 = .006\).

When dog guardians were asked to rate their physical health, contrary to expectations, among dog guardians with low levels of human social support, after controlling for marital status, education, income, and the amount of time dog guardians engaged in physical activity during the previous week, dog guardians’ health ratings did not differ significantly depending on whether they engaged in low \((M = 1.75, SE = 0.12)\) or high \((M = 1.74, SE = 0.13)\) levels of anthropomorphism, \(F(1, 100) = 0.01, p > .05\), partial \(n^2 = .000\). As expected, however, among dog guardians with high levels of human social support, after controlling for education and whether dog guardians had experienced a traumatic event in the past month, dog guardians’ health ratings did not differ significantly depending on whether they engaged in low \((M = 1.27, SE = 0.10)\) or high \((M = 1.40, SE = 0.13)\) levels of anthropomorphism, \(F(1, 89) = 0.67, p > .05\), partial \(n^2 = .007\).

Hypotheses were next examined with respect to psychological health, as assessed through stress and depression levels. With respect to stress, contrary to expectations, among dog guardians with low levels of human social support, after controlling for the amount of time dog guardians engaged in physical activity during the previous week, dog guardians’ stress levels did not differ significantly depending on whether they engaged in low \((M = 1.78, SE = 0.08)\) or high \((M = 1.89, SE = 0.08)\) levels of anthropomorphism, \(F(1, 106) = 0.87, p > .05\), partial \(n^2 = .008\). In addition, contrary to expectations, among dog guardians with high levels of human social support, after controlling for the amount of time dog guardians spent in nature during the previous week, dog guardians who engaged in high levels of anthropomorphism \((M = 1.68, SE = 0.08)\) had significantly higher stress levels compared to dog guardians who engaged in low levels of anthropomorphism, \(F(1, 106) = 4.56, p < .05\), partial \(n^2 = .042\).
guardians who engaged in low levels of anthropomorphism ($M = 1.33, SE = 0.06$), $F(1, 88) = 12.08, p < .01$, partial $n^2 = .121$.

With respect to depression, as hypothesized, among dog guardians with low levels of human social support, after controlling for the amount of time dog guardians engaged in physical activity during the previous week, dog guardians who engaged in high levels of anthropomorphism ($M = 0.97, SE = 0.08$) had significantly higher depression levels compared to dog guardians who engaged in low levels of anthropomorphism ($M = 0.76, SE = 0.07$), $F(1, 103) = 4.01, p < .05$, partial $n^2 = .037$. Contrary to expectations, however, among dog guardians with high levels of human social support, after controlling for income, dog guardians who engaged in high levels of anthropomorphism ($M = 0.56, SE = 0.05$) also had significantly higher levels of depression compared to dog guardians who engaged in low levels of anthropomorphism ($M = 0.37, SE = 0.04$), $F(1, 84) = 7.85, p < .01$, partial $n^2 = .085$.

Additional Analyses

Additional analyses were conducted to identify any confounded variables that might provide alternative explanations for the observed significant simple effects. Specifically, for any significant results, any demographic or additional measures (physical activity during the previous week, time spent in a natural environment during the previous week, years of dog companionship, and whether participants had experienced a traumatic event in the past month) that correlated with both the independent and the dependent variable were identified as potential confounds. Following which, analyses (i.e., simple effects) were repeated, controlling for the effects of the potential confound. Using this approach, no confounds were identified.

Discussion

The purpose of the present study was to examine the relation between anthropomorphism and dog guardians’ physical and psychological health, while taking into consideration their perceived levels of human social support. Our findings suggest that anthropomorphism and human social support play important roles for some aspects of dog guardians’ physical and psychological health.

Physical Health

Consistent with our expectations, dog guardians with high levels of human social support did not differ significantly in their number of doctor visits or
number of medications according to whether they engaged in low or high levels of anthropomorphism. In addition, as expected, among dog guardians with low levels of human social support, those who engaged in high levels of anthropomorphism had significantly more doctor visits and took significantly more medications than those who engaged in low levels of anthropomorphism. The preceding finding for dog guardians with low levels of human social support is not surprising, given that researchers have found that individuals who are lonely or lacking human social support are more likely to engage in anthropomorphism than those who are not lonely or lacking human social support (Duvall Antonacopoulos & Pychyl, 2008; Epley et al., 2008a, 2008b; Albert & Bulcroft, 1988), and the less human social support individuals have, the poorer their physical health (Friedmann & Thomas, 1995; House, Landis, & Umberson, 1988; Berkman & Syme, 1979). The importance of social support is demonstrated by House et al.’s (1988) statement that insufficient social relationships “constitute a major risk factor for health—rivaling the effects of well-established health risk factors such as cigarette smoking, blood pressure, blood lipids, obesity, and physical activity” (p. 541).

Epley et al. (2008a) suggest that some individuals who have unsatisfactory social relationships may attempt to alleviate their feelings of social disconnect through their companion animals, specifically by humanizing them. However, it is possible that, rather than helping dog guardians, engaging in anthropomorphism may exacerbate their feelings of loneliness, which could explain why, among dog guardians with low levels of human social support, those dog guardians who engaged in high levels of anthropomorphism had poorer physical health than those who engaged in low levels of anthropomorphism. Further support for this idea comes from the fact that researchers have found that loneliness has negative effects on physical health (Hawkley, Masi, & Berry, 2006; Cacioppo et al., 2002; Sorkin, Rook, & Lu, 2002). Alternatively, another possible explanation for this finding is that dog guardians who have insufficient human social support and poor health may engage in anthropomorphism as a coping strategy. Individuals who have poor health may have to spend more time at home and, therefore, may humanize their companion animal if they do not have adequate human social support.

With respect to our third physical health measure, dog guardians’ subjective rating of their health, we found as hypothesized that among dog guardians with high levels of human social support, health ratings did not differ significantly according to whether dog guardians engaged in low or high levels of anthropomorphism. Contrary to our hypothesis, however, dog guardians with low levels of human social support also did not differ significantly
in their rating of their physical health according to whether they engaged in low or high levels of anthropomorphism. The health rating measure differed from the other physical health measures in that it was a more subjective type of question. For the questions regarding doctor visits and medications, participants were asked to indicate the number of times they had visited a doctor and the number of medications they had taken during specific time periods. For these questions, participants likely thought back to the time periods in question and provided numbers based on their actual experiences. We speculate, however, that when participants were asked to rate their health on a five-point scale ranging from poor to excellent, they may have compared their health relative to other people they know who have poorer health and, as a result, rated their health positively. This may explain the fact that there was a lack of variability in participants’ responses to this question: 75.8% of participants indicated that their health was either good or very good. The findings for this measure may reflect the lack of variability in responses, rather than nonsignificant differences with respect to the physical health ratings of individuals who lacked human social support and engaged in low or high levels of anthropomorphism.

Psychological Health

With respect to psychological health, three of our four findings were inconsistent with our hypotheses. Unexpectedly, we found that, among dog guardians with high levels of human social support, those who engaged in high levels of anthropomorphism were significantly more stressed than those who engaged in low levels of anthropomorphism. Contrary to our expectations, we found that among dog guardians with low levels of human social support, stress levels did not differ significantly depending on whether dog guardians engaged in low or high levels of anthropomorphism. It may be that, among dog guardians with low levels of human social support, stress levels did not vary depending on whether dog guardians engaged in low or high levels of anthropomorphism because dog guardians who lack human social support already have highly elevated levels of stress. Support for this is provided by the fact that researchers have found that a negative relation exists between social support and stress, with individuals who have low levels of human social support reporting high levels of stress (Jou & Fukada, 1997; Wills, 1990). In addition, in the present study dog guardians with low levels of human social support had significantly higher stress levels compared to dog guardians with high levels of human social support. Therefore, if these individuals have high levels of stress, engaging in anthropomorphism may be neither beneficial nor detrimental to their well-being.
A possible explanation for the finding that, among dog guardians with high levels of human social support, those who engaged in high rather than low levels of anthropomorphism were significantly more stressed is that dog guardians who engage in high levels of anthropomorphism may end up with a more dependent and needy dog than dog guardians who engage in low levels of anthropomorphism. Belk (1996) describes how some guardians make a point of sharing their meals with their dog and allowing the dog to sleep with them. If dogs are treated in a similar manner to people, they may develop expectations as to how they should be treated. For example, a dog who is usually fed at mealtimes and is allowed to sleep with his or her guardians may become stressed if the guardians miss meals or are away from home overnight. For dog guardians with sufficient human social support, a needy dog may be problematic and increase their stress levels if, because of their dog, they feel compelled to limit their social activities.

In terms of depression levels, we found that among dog guardians with both low and high levels of human social support, those who engaged in high levels of anthropomorphism had significantly higher levels of depression compared to those who engaged in low levels of anthropomorphism. One possible explanation for these findings is that, irrespective of human social support levels, people who are depressed may engage in anthropomorphism in an attempt to relieve their feelings of depression. Alternatively, it may be that individuals who humanize their dog spend more time with him or her; this, however, may not be beneficial for dog guardians. Albert and Bulcroft (1988) found that attachment to companion animals and anthropomorphism correlated at .69. Given that Cohen (2002) found that, as attachment to companion animals increases, the amount of time spent with the animal increases, it is likely that the more individuals humanize their dog, the more time they spend with him or her. If, as a result of humanizing their dog, dog guardians are spending long periods of time with the dog rather than with people, they may feel even more lonely and depressed. Indeed, researchers have found that feeling socially connected to other people is important for well-being (Townsend & McWhirter, 2005).

**Limitations of the Research**

An obvious limitation of the present study is the fact that 90% of the sample was female. It would have been of interest to examine our hypotheses separately for males and females, given that previous research has found that females are more likely than males to engage in anthropomorphism (Dotson & Hyatt, 2008; Duvall Antonacopoulos & Pychyl, 2008) and are more likely
to engage in specific acts of anthropomorphism, such as talking to their dog as if the dog is a young child (Prato-Previde, Fallani, & Valsecchi, 2006) or dressing the dog in clothes (Mallon, 1993).

The study is also limited in that we cannot determine the direction of the relationships. As an example, based on our findings we do not know whether, among dog guardians with low levels of human social support, engaging in high levels of anthropomorphism resulted in poor physical health (increased number of doctor visits and medications) or whether, among dog guardians with low levels of human social support, having poor physical health led them to engage in high levels of anthropomorphism. Finally, given that we did not have a control group of non-guardians with low and high levels of human social support, our findings are limited in that we do not know how the health of non-dog-guardians compares to dog guardians who engage in low and high levels of anthropomorphism and have low and high levels of human social support.

**Suggestions for Future Research**

Researchers need to replicate the present study with cats, as there is evidence that people also humanize their cats (Holbrook, Stephens, Day, Holbrook, & Strazar, 2001; Belk, 1996; Hirschman, 1994). In addition, a future study needs to consider the possibility that anthropomorphism, social support, and attachment to companion animals interact to predict physical and psychological health, given that researchers have found a positive relation between attachment to companion animals and anthropomorphism (Albert & Bulcroft, 1988) and have also found that level of attachment to companion animals affects human health (Headey, Na, & Zheng, 2008; Budge et al., 1998; Keil, 1998; Garrity, Stallones, Marx, & Johnson, 1989).

Researchers also need to conduct qualitative studies, which would enable them to explore directly why dog guardians engage in anthropomorphism. While individuals who lack human social support may humanize their dog because they are lonely, individuals with high levels of human social support may humanize their dog for other reasons. For example, Veevers (1985) suggests that companion animals may be dressed in human clothing to serve as status symbols reflecting their guardians’ wealth. Finally, there is the need for a longitudinal study with individuals before and after they acquire a dog, in order to determine whether people with poorer health are more likely to engage in high levels of anthropomorphism or whether, after people acquire a dog and engage in high levels of anthropomorphism, their health becomes worse. In light of the findings of the present study, a longitudinal study
would also need to take into consideration dog guardians’ human social support levels before and after they acquire a dog.

Conclusions

To our knowledge, this is the first study to examine the relation between anthropomorphism and dog guardians’ health, while considering human social support levels. Our results suggest that some aspects of dog guardians’ physical health (doctor visits, number of medications) and psychological health (stress) may be affected by both how much human social support they have and whether they engage in low or high levels of anthropomorphism. These findings provide new insight into the possible impact of anthropomorphism on human health and indicate that there is a need for additional research examining the potential negative consequences for some dog guardians of engaging in anthropomorphic behavior.

Notes

1. In Canada, individuals who have lived in a conjugal relationship for at least 12 continuous months are considered to be in a common-law relationship for legal purposes, such as income tax. Prior to one year, individuals are considered to be cohabitating.

2. In Canada a distinction is generally drawn between college and university. Colleges tend to offer certificates and diplomas and provide practical training for specific occupations, while universities grant academic degrees at the bachelor's, master's, and doctoral level (Canadian Bureau for International Education, 2010).

3. Prior to conducting simple effects, a median split analysis was conducted for the independent variables, anthropomorphism and human social support, in order to divide participants into two groups according to whether they engaged in low or high levels of anthropomorphism and had low or high levels of human social support.

4. Participants’ income was divided at $35,000 before tax, given that the average 2005 income before tax in Canada was $35,498 (Statistics Canada, 2006).

References


