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Abstract

Fertility rates continue to decline globally amidst the second demographic transition, marked by urbanization, increased educational attainment, and most importantly, a new flexibility in life-course organization. As a result, some individuals are choosing to bring companion animals in the home rather than raising children. **Purpose** The purpose of this study is to explore whether these transitions result in differential companion animal attachment and caregiving behavior in the homes of parents (or those who desire to become parents) and nonparents or childfree "pet parents." **Methods** A total of 917 respondents completed an online survey via Qualtrics that included demographic questions, the Lexington Attachment to Pets Scale (LAPS), and Likert-scale questions designed to probe direct and indirect caretaking behaviors. **Results** Nonparents reported more *Generalized Attachment* and more *Affective Responsiveness* to their companion animals, as well as increased investment in *General Care*. They also reported more *People Substituting* on the LAPS. Parents and nonparents reported similar agreement regarding *Animal Rights/Welfare* and *Training and Play*. **Conclusion** I conclude that nonparents' investment in companion animals much like parents invest in children, but in ways that meet species-specific needs. This supports the notion that nonparents may be nurturing companion animals as a trade-off to raising children, but not as a substitute. This is an evolutionarily novel application of parenting strategies in a new, flexible environment.

Keywords

alloparenting, companion animals, attachment, caregiving behavior

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Introduction

Global fertility rates have been declining for decades, and in some societies, for over a century (Goode, 1970; Murray et al., 2018; World Bank, 2021). In many cases, these declines are attributed to demographic changes such as urbanization, increasing middle classes, increased access to education, and women's reproductive autonomy. Relatedly, scholars argue for a connection between increased child survival and reduced fertility (quality vs. quantity) (e.g., Lawson et al., 2012; Lawson & Mace, 2011), which many post-demographic transition cultures enable. However, a growing number of societies are also experiencing the emergence of people who remain voluntarily childless ("childfree"), as well as an increase in investment in companion animals. For example, the American Pet Products Association (APPA) reported that Americans spent over $103 bn on companion animals in 2020 (APPA, 2021), most of which was spent in the nearly 100 million homes with dogs and cats. The purpose of this study is to explore whether these transitions result in differential companion animal attachment and caregiving behavior in the homes of parents (or those who desire to become parents) and nonparents (or childfree "pet parents").

Often viewed as a biological or psychological pathology (Blackstone & Stewart, 2012), it is an evolutionary puzzle that humans would choose to forego their own reproductive success (Newson, 2015). It is particularly intriguing that this occurs predominantly in societies where resources are not scarce. For example, the highest rates of voluntary childlessness appear to be in Group of Seven nations such as the United States, Germany, France, the United Kingdom, and Japan (see

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Volsche, 2019 for a discussion). Given the quality versus quantity trade-off, and the biological nature of reproductive fitness, we should expect couples in these societies to invest heavily in at least one biological child. Yet a growing number of individuals are actively choosing to have none. This suggests factors other than simple fitness are influencing reproductive trade-offs.

Lestaeghe (2014) proposed that a second demographic transition (2DT) was occurring after the turn of the millennium. While he may not have imagined individuals would fully forego reproduction, he does identify subreplacement fertility (lower than 2.1 births per woman), a focus on "higher order" needs (see Maslow, 1947), and increasingly flexible life-course organization as markers of the 2DT. In evolutionary terms, life history trade-offs become increasingly complicated when an individual's personal preference, rather than basic needs, becomes part of the decision-making process. Yet, humans are known to be nurturing, even to persons outside their immediate, biological kin, and it could be argued this need to nurture is crucial to our emotional and social wellbeing. So, what happens to this nurturing behavior when people choose not to have children?

Veevers (1980) suggested that people, especially couples, who choose not to have children may bring companion animals into the home as surrogate children. This perspective remains common in scholarship and among the public. In fact, companion animal products manufacturers and retailers often rely upon it (see "Parents and Their Fur Babies," 2017). However, work with childfree individuals suggests more nuanced relationships with companion animals. Laurent-Simpson (2017a) found that perceptions of an animal as "minded" and communicative can encourage the development of a parent identity, but participants displayed that role in ways that focused on species-specific needs of the companion animal as a nonhuman agent. Likewise, Volsche (2018) found that self-identified childfree "pet parents" report using the language of parenting as social shorthand, while also specifically choosing "dogs over children." This suggests it is possible that individuals who are either undecided or chose not to have children, may in fact raise companion animals as an intermediary relationship that engages one's need to nurture without the fulltime demands of biological offspring. This can be viewed as a trade-off that is more refined than parent or not parent, nurture or not nurture. In some situations, the demands of a companion animal may solidify reproductive uncertainty into a choice not to have children (Laurent-Simpson, 2017b).

On the surface, this choice seems maladaptive. After all, people choosing not to biologically reproduce are, quite literally, removing themselves from evolutionary processes. However, this concern may not be as strong for humans. Hrdy (2009) argues that humans are cooperative breeders, with multiple individuals beyond the biological parents investing in the raising of offspring. Alloparental care is thus, a key trait of our species. If nurturing, rather than specifically parenting, is a species-level trait, it could vary greatly depending upon resource availability, kin support networks, and in the case of societies experiencing the 2DT, personal choice. Much like humans may alloparent others' children in foraging societies (Crittenden & Marlowe, 2008), in an urban environment, filled with advertisements for companion animal adoption and products, humans may be primed to alloparent a completely different species. This would then lead to investment of time, money, and emotionality in companion animals that easily mirrors a parent's investment in children.

Despite the interest in companion animal caregiving, attachment, and the emergence of pet parenting as a practice, little research specifically focuses on comparing homes with children and homes without children. Even less literature attempts to understand this phenomenon from an evolutionary perspective. Since Veevers briefly mentioned pets as child surrogates (1980) and as social capital in a variety of ways (1985), most of the research on pet parenting has specifically looked at individuals who do not have children, emphasizing sociocultural factors such as identity and role development and the negotiation of relationships and agency between companion animal and guardian.

In this vein, the following is the first study of which I am aware that attempts to quantify differences in companion animal directed attachment and caretaking behaviors between parents and nonparents. In addition to collecting demographic data, I compare scores from the Lexington Attachment to Pets Scale (LAPS, Johnson et al., 1992) with a series of questions designed to probe caregiving behaviors related to direct care, indirect care, and autonomy of companion animals. This study seeks to ask: Are there differences in companion animal attachment and caretaking behaviors between parents and nonparents in the United States? My hypotheses are:

H1: Nonparents will agree more strongly on the LAPS, especially *General Attachment* and *People Substituting*, than parents or those who desire to become parents.
H2: Nonparents view their companion animals as more "minded" when compared to parents or those who desire to become parents, causing them to ascribe more autonomy to their companion animals.
H3: Nonparents will invest more in the direct and indirect care of their companion animals than parents or those who desire to become parents.

Material and Methods

Participants

I recruited adults aged 18 years and older, living in the United States, who live with at least one companion animal. There were no other exclusion criteria. Respondents followed a Bit.ly link to the Qualtrics Survey either directly from social media (primarily Twitter) or from other sources (e.g., email, text, Facebook) via snowball sampling. To achieve a desired statistical power, the target sample was 500 valid responses (G*Power

suggests a minimum $n = 294$). Data collection occurred from April to August 2020.

Upon landing on the survey page, respondents were presented with an Informed Consent script detailing the study, inclusion criteria, and other information as prescribed and approved by Boise State University's IRB (protocol #041-SB19-272). Respondents consented, or not, by responding to the question, "I have read the above information and" with the options, "Yes, I would like to continue with the survey," or "No, I prefer NOT to participate at this time." Positive and negative responses were captured as variable "IC (Informed Consent)" in the Qualtrics dataset for ease of removing non-consenting information from the final dataset.

Every effort was made to keep the survey anonymous (e.g., no names, addresses, etc. were collected). However, in preparation for a possible follow-up qualitative project, respondents were given the opportunity to opt-in to future work by providing their email at the end of the survey. Emails were collected as a response to the statement "If you would like to be contacted about participating in an interview about your relationship and interactions with your pet(s), please provide a good email address where we can contact you." This was not a required question, and respondents could choose to submit their survey without completing this question.

Materials and Procedure

The survey consisted of four primary sections—Demographic and Background Questions, Relationship to Pets, LAPS, and Questions Regarding Parenting Strategies Related to Pets. There were also two open-ended questions asking respondents to describe any shared pet care with others in the home and any additional details they feel are relevant to their experience living with companion animals. The word "pet" was used in the survey to reflect the cultural language more accurately, as "companion animal" is less commonly used in marketing and the general public.

Demographic and background questions. The first section collected traditional demographic information such as age group, sex, gender, ethnicity, and education. Additional questions probed respondents' relationships with children, relationship status, and the presence of dogs and cats in the home while growing up. The question regarding relationships with children provided a range from "I have biological children living with me" and "I want children, but do not have any at this time," to "I do not want children, now or in the future." Options also captured the presence of foster children, stepchildren living in or not living in the home, and the chance to self-identify as childfree by choice. These categories were ultimately collapsed into "Have/Want Children" and "No Children/Childfree."

Relationship to pet(s). The relationship to pet(s) section asked about the number of dogs and cats in the home, presence of other species, co-sleeping ("Where does your pet usually sleep?"), and what type of diet the pet(s) is routinely fed. Other questions in this section probed the level of perceived affiliation by asking about companion animal-related language used with friends and relatives compared to coworkers or strangers. These questions included "When talking to close friends and relatives about your relationship with your pet(s), how do you most frequently refer to yourself?" Options included "owner," "parent (mom/dad)," "guardian," "friend," "caretaker," or "other, please explain," and "When talking to close friends and relatives about your relationship with your pet(s), how do you most frequently refer to your pet(s)?" with the options, "animal (dog/cat)," "pet," "kids/children," "girls/boys," "friend," "roommate," "family member," and "other, please explain." The same two questions were then asked with the context established as talking to coworkers or strangers, rather than close friends and relatives.

Lexington attachment to pets scale. The LAPS was selected to measure attachment variables as it is one of the most well validated and commonly used scales for attachment to companion animals (Johnson et al., 1992), such that it has been translated and validated for use in other languages (e.g., Ramírez et al., 2014). The LAPS includes 23 Likert-scale questions measured from "1 = strongly agree" to "4 = strongly disagree." The factors measured in the LAPS include *General Attachment, People Substituting,* and *Animal Rights/Animal Welfare.* These factors make it particularly valuable in investigating the phenomenon of "pet parenting" because it measures both attachment and the tendency to substitute people with companion animals. Examples of statements include "I think my pet is just a pet," "My pet and I have a very close relationship," and "I feel that my pet is a part of my family." Two statements ("I think my pet is just a pet" and "I am not very attached to my pet") were reverse coded in the analysis as prescribed by Johnson et al. (1992).

Questions regarding parenting strategies related to pets. A series of 25 Likert-scale questions measured the frequency with which respondents engaged in certain caretaking and attachment behaviors with their companion animals. Responses ranged from "1 = never" to "5 = always." The statements derived from the concepts of direct and indirect care as defined by Kleiman and Malcolm (1981) to capture the application of different forms of parenting behavior toward companion animals. Examples include "I am the person who grooms my pet," "I play games with my pet," "I hug/cuddle my pet," and "I consider my pet when paying bills/making a budget." A principal components analysis tested whether these statements fell into the direct and indirect care categories as anticipated and is discussed in the Results. This series of questions is labeled CARES (Companion Animal RElationshipS) in the remainder of this article.

Data Analyses

After exporting the raw dataset from Qualtrics to Microsoft Excel, initial cleaning involved removal of "No" responses to question IC and deletion of incomplete responses. Responses were numerically coded and imported into SPSS V26. Principal Components Analysis with varimax rotation reduced the dimensions of the CARES, and comparisons were made using these factors rather than the full set of statements. Because of the nominal and ordinal nature of most variables, as well as the anticipated distribution of the data, I used nonparametric tests such as Mann-Whitney and χ^2 tests of independence. Likewise, a probability of superiority (PS) test measured effect size.

Results

Participants

I received a total of 1,197 responses to the survey. After removing incomplete or duplicate responses, the final sample was $n = 917$. As is frequently the case, the sample was predominantly female (80.3% by gender identity, 85.7% by sex), white (87.4%), heterosexual (84.9%), and college educated (bachelor's, 39.3%; master's, 27.4%; doctorate or professional, 10.6%). This is a common artifact of survey work, particularly when collecting data related to companion animals (see Herzog, 2007 for a discussion). Likewise, most of the respondents reported being married or in a domestic partnership for over 1 year (57.4%) or in an exclusive relationship for over 1 year (11.3%). Less than a quarter of the respondents reported either being "single and looking" (11.6%) or "single, not looking" (12.2%). For full demographic details, see Table 1.

Importantly to my hypothesis, respondents answered questions about their current or planned relationships with children in the home. Statements ranged from "I have biological children living with me" to "I identify as childfree." Additional options included "I have stepchildren not living with me" and "I am actively involved in caring for my nieces/nephews." Respondents could also select "I want children, but do not have any at this time" or "I do not want children, now or in the future" to address family planning goals. These responses were collapsed into the following three categories for analysis: "Have/Want Children (67.6%)" "No Children/Childfree (27.7%)," and "Undecided/Alloparents (3.8%)," with 0.9% of the sample not answering the question, then further collapsed into "Have/Want Children (72.3%)" and "No Children/Childfree (27.7%)" to acknowledge that ambiguity could result in choosing parenthood. This also reflects the CDC's most recent fertility data more accurately (Hamilton et al., 2020).

Table 1. Respondent Demographics ($n = 917$).

	n (%)		*n* (%)
Gender		*Sex*	
Female	736 (80.3)	Female	786 (85.7)
Male	127 (13.8)	Male	131 (14.3)
Non-binary	8 (0.9)	Age	
Queer	8 (0.9)	18–24	147 (16.0)
Other	3 (0.3)	25–35	277 (30.2)
Trans FtM	2 (0.2)	36–46	187 (20.4)
Trans MtF	1 (0.1)	46–60	197 (21.5)
Did not answer	32 (3.5)	61+	82 (8.9)
		Did not answer	27 (2.9)
Ethic/racial background		*Sexual orientation*	
White	801 (87.4)	Heterosexual	776 (84.9)
Hispanic or Latino/a	55 (6.0)	Bisexual	63 (6.9)
Asian or Asian American	15 (1.6)	Homosexual	41 (4.5)
Native American/ Alaskan Native	8 (0.9)	Pansexual	13 (1.4)
		Asexual	10 (1.1)
Black or African American	7 (0.8)	Other	11 (1.2)
Other	27 (2.9)	Did not answer	3 (0.3)
Did not answer	1 (0.1)		
Education		*Income*	
High school	102 (11.1)	$0–9,525	76 (8.3)
Technical or vocational	22 (2.4)	$9,526–38,700	160 (17.4)
Associate	84 (9.2)	$38,701–82,500	376 (41.0)
Bachelor's	360 (39.3)	$82,501–157,500	177 (19.3)
Master's	251 (27.4)	$157,501+	61 (6.7)
Doctorate or professional	97 (10.6)	Prefer not to disclose	67 (7.3)
Did not answer	1 (0.1)		
Parental status[a]		*Relationship status*	
Have/want children	620 (67.6)	Married over 1 year	526 (57.4)
No children/ childfree	254 (27.7)	Married less than 1 year	17 (1.9)
Undecided/ alloparents	35 (3.8)	Exclusive over 1 year	104 (11.3)
No answer	8 (0.9)	Exclusive less than 1 year	31 (3.4)
		Dating, not exclusive	19 (2.1)
		Single and looking	106 (11.6)
		Single, not looking	112 (12.2)
		Did not answer	2 (0.2)

[a]Parental status was determined by asking a series of questions related to the presence of children in the home; desire and intention to have children in the future; and self-identification as a parent or childfree. The categories were then collapsed into these three, primary themes.

Relationships With Companion Animals

When selecting the words used to describe themselves and their companion animals, an interesting shift occurred. When referencing themselves with friends and relatives, respondents were more likely to report using "parent (Mom/Dad)" (64.8%) and "Kids/Children" (22.6%) or "Family" (15.4%)." However, when speaking to strangers or coworkers, these number shifted significantly, with a higher percentage using "Owner" (52.7%) and "Animal (Dog/Cat)" (40.8%) or "Pet" (22.1%). This rate of code switching suggests many companion

Table 2. Relationship Language Used With Companion Animals.

Referencing self when talking to friends and relatives …	*n* (%)	Referencing pet when talking to friends and relatives …	*n* (%)
Owner	227 (24.8)	Animal (dog/cat)	244 (26.6)
Parent (mom/dad)	594 (64.8)	Pet	112 (12.2)
Guardian	19 (2.1)	Kids/children	207 (22.6)
Friend	31 (3.4)	Girls/boys	107 (11.7)
Caretaker	14 (1.5)	Friend	15 (1.6)
Other	30 (3.3)	Roommate	2 (0.2)
Did not answer	2 (0.2)	Family member	141 (15.4)
		Other	87 (9.5)
		Did no answer	2 (0.2)
Referencing self when talking to coworkers or strangers …	*n* (%)	Referencing pet when talking to coworkers or strangers …	*n* (%)
Owner	483 (52.7)	Animal (dog/cat)	374 (40.8)
Parent (mom/dad)	339 (37.0)	Pet	203 (22.1)
Guardian	18 (2.0)	Kids/children	114 (12.4)
Friend	21 (2.3)	Girls/boys	60 (6.5)
Caretaker	19 (2.1)	Friend	19 (2.1)
Other	32 (3.5)	Roommate	1 (0.1)
Did not answer	5 (0.5)	Family member	93 (10.1)
		Other	53 (5.8)
		Did no answer	0 (0.0)

animal guardians are acutely aware of the potential judgment for anthropomorphizing their companion animal. Yet, in more intimate circles of friends and family, affiliative terminology is more common.

Respondents had the option to write in other terms used when referring to their companion animals by answering "other (please explain)." As many as 9.5% of respondents wrote in alternatives for their companion animal, including "overlord," "fur baby," "my pack," and "the gang." Respondents also identified calling themselves "her slave," "the can opener," and "the leader." Full statistics of the language used to describe relationships can be found in Table 2.

A Chi-squared test of independence showed that individuals in the "No Children/Childfree" category were more likely to identify themselves with familial terms (e.g., parent, guardian) when speaking to friends and family ($\chi^2 = 19.179$, $p = .004$) and with coworkers or strangers ($\chi^2 = 13.414$, $p = .037$). Interestingly, there was no statistically significant differences between respondents categorized as "No Children/Childfree" or "Have/Want Children" when selecting words used to refer directly to companion animals (e.g., pet, kids, family member).

Lexington Attachment to Pets Scale

The LAPS contains three validated scales—*Animal Rights/Welfare, General Attachment,* and *People Substituting* (Johnson et al., 1992). I compared the groups "Have/Want Children" and "No Children/Childfree" on these scales and found that the "No Children/Childfree" group were more likely to agree with statements pertaining to *General Attachment* ($U = 75{,}776.50$, $p = .019$, PS = .550) and *People Substituting* ($U = 67{,}949.50$, $p = .001$, PS = 0.597). This aligns with my hypothesis that people who do not have or plan to have children are more attached to their companion animals when compared with parents. Likewise, some items in the *People Substituting* scale can be interpreted to reflect "mindedness" as described by Laurent-Simpson (2017a), as attention to the individual personality and needs of a companion animal can appear substitutional. Table 3 summarizes the comparisons between these two groups on the three scales of the LAPS.

Table 3. Sample Descriptives for Lexington Attachment to Pets Scale (LAPS) by Scale.

	Have/want children[a]		No children/ childfree				
	n	Mean rank[b]	*n*	Mean rank[b]	*U*	*p*	PS[c]
Scale 1[d]	663	469.25	254	432.24	77403.00	.056	0.540
Scale 2[d]	663	471.71	254	425.83	75776.50	.019	0.550
Scale 3[d]	663	483.51	254	395.02	67949.50	.001	0.597

[a]The demographic category "undecided/alloparent" was collapsed into "Have/Want Children" to account for the ambiguity that these individuals may choose to have children.
[b]Lower Mean Rank signifies more agreement with statements from the scale.
[c]Probability of Superiority (PS) measured effect size as it does not expect nor require equal and normal distribution of data.
[d]Scale 1 = *Animal Rights/Animal Welfare;* Scale 2 = *General Attachment;* Scale 3 = *People Substituting* (Johnson et al., 1992).

Companion Animal Relationships (CARES) Items

Twenty-five items measured the frequency with which respondents engaged in certain caretaking and attachment behaviors with their companion animals. I completed a factor analysis with varimax rotation, which converged in four iterations. Two items ("I feed my pet 'people' food" and "I take my pet to a groomer") failed to load to a single scale. Additionally, the statements "Someone else feeds my pet," "Someone else plays with my pet," and "Someone else walks/exercises my pet" required reverse scoring. Three scales emerged, and I labeled these *Affective Responsiveness, Training and Play,* and *General Care.* Table 4 includes a list of the items by scale, loading scores for each item, and Cronbach's alpha scores for each scale.

Scale 1, *Affective Responsiveness*, includes ten statements with loading scores ranging from 0.528 to 0.694 with good

Table 4. Companion Animal RElationshipS (CARES) Items by Scale with Loading Scores.

Scale 1: Affective responsiveness ($\alpha = 0.810$)	Loading
I am protective of my pet.	0.694
I hug/cuddle my pet.	0.679
I consider my pet's preferences when interacting with them.	0.658
I kiss my pet.	0.649
I console my pet when they are upset/nervous/scared.	0.638
I worry about my pet when we are not together.	0.610
I let my pet request play/walks from me.	0.599
I leave work/stay home if my pet is sick.	0.565
I consider my pet when paying bills/making a budget.	0.545
I allow my pet to make decisions when on walks or playing.	0.528
Scale 2: Training and Play ($\alpha = 0.780$)	**Loading**
I engage in training activities with my pet.	0.773
I take my pet to socialize with others of their species.	0.733
I walk/exercise my pet.	0.718
I engage in pet related sports with my pet.	0.686
I take my pet to training classes.	0.561
I play games with my pet.	0.538
I engage in rough and tumble play with my pet.	0.460
Scale 3: General Care ($\alpha = 0.707$)	**Loading**
Someone else feeds my pet.[a]	0.803
I am the person who feeds my pet.	0.755
Someone else plays with my pet.[a]	0.629
If my pet needs to go to the veterinarian, I am the person who takes them.	0.607
Some else walks/exercises my pet.[a]	0.584
I am the person who grooms my pet.	0.404

Extraction method: Principal component analysis.
Rotation method: Varimax w/Kaiser (rotation converged in four iterations).
[a]These items were reverse scored.

reliability ($\alpha = 0.810$). Statements in this scale reflect demonstrations of affection ("I kiss my pet"), inclusion of companion animals in life decisions ("I leave work/stay home if my pet is sick"), and attributions of autonomy to specific companion animal needs ("I let my pet request play/walks from me"). The group "No Children/Childfree" reported higher frequencies on items in this scale compared to those who "Have/Want Children" ($U = 63{,}208.00$; $p = .001$; PS = 0.625).

Scale 2, *Training and Play*, includes seven items with loading scores ranging from 0.460 to 0.773 with acceptable, but nearing good, reliability ($\alpha = 0.780$). Statements in this scale reflect meeting exercise needs ("I walk/exercise my pet"), attending to training and socialization needs ("I engage in training activities with my pet"), and types of play or sport ("I engage in rough and tumble play with my pet"). There was no statistically significant difference between the two groups on this scale ($U = 82{,}870.00$; $p = .710$; PS = 0.508), perhaps because social norms specifically address these as forms of care necessary to being a "good pet owner."

Scale 3, *General Care*, includes six statements with loading scores ranging from 0.404 to 0.803, with acceptable reliability ($\alpha = 0.707$). This scale also includes all three of the reversed scored items in the CARES ("Someone else feeds my pet," "Someone else plays with my pet," and "Some else walks/exercises my pet") and an important question about veterinary care ("If my pet needs to go to the veterinarian, I am the person who takes them"). The group "No Children/Childfree" reported higher frequencies on items in this scale, or lower frequencies on reverse coded items, compared to those who "Have/Want Children" ($U = 70{,}645.50$; $p = .001$; PS = 0.580). Table 5 summarizes the comparison between these two groups on the CARES scales.

Discussion

The results of this survey are consistent with the hypotheses that (1) nonparents will agree more strongly on the LAPSs, especially *General Attachment* and *People Substituting*, than parents or those who desire to become parents and (2) nonparents view their companion animals as more "minded" when compared to parents or those who desire to become parents, causing them to ascribe more autonomy to their companion animals. Interestingly, the third hypothesis, nonparents will invest more in the direct and indirect care of their companion animals than parents or those who desire to become parents, is only partially supported. Perhaps not surprisingly, the scale *Training and Play* found no difference between parents and nonparents. While this information may seem to make "common sense" to many, unpacking it in the vein of evolutionary theory uncovers a potentially interesting overlap in the goals of parents and nonparent companion animal guardians.

Regarding hypothesis one, nonparents were more likely to agree on the scales *Generalized Attachment* and *People Substituting*, but not on the scale *Animal Rights/Welfare. Generalized Attachment* includes statements such as "My pet and I have a very close relationship" and "I play with my pet quite often." That parents would be less likely to agree with these statements aligns with Herzog's (2010) and Pierce's (2016) arguments that parents often obtain companion animals for their children more than for themselves. Alternatively, nonparents are actively engaging in relationships with companion animals on a more intimate level than parents. Likewise, they are often more invested in their companion animal's happiness as their primary avenue of nurturing (e.g., Volsche, 2018). This also relates to the higher agreement on *People Substituting*, as nonparents negotiate their relationships with companion animals in a more affiliative way than parents. These statements include "I enjoy showing other people pictures of my pet" and "Quite often, my feelings toward people are affected by the way they react to my pet." Clearly, exchanging the word "pet" for the word "child" results in statements with which parents could easily agree.

Interestingly, there is no statistically significant difference on the scale *Animal Rights/Welfare.* We might expect nonparents to agree more strongly because of the "mindedness" ascribed and

Table 5. Sample Descriptives for Companion Animal RElationshipS (CARE) by Scale.

	Have/want children[a]		No children/ childfree				
	n	Mean rank[b]	*n*	Mean rank[b]	*U*	*p*	PS[c]
Scale 1[d]	663	427.34	254	541.65	63208.00	.001	0.625
Scale 2[d]	663	461.01	254	453.76	82870.00	.710	0.508
Scale 3[d]	663	438.55	254	512.37	70645.50	.001	0.580

[a]The demographic category "undecided/alloparent" was collapsed into "Have/Want Children" to account for the ambiguity that these individuals may choose to have children.
[b]Higher Mean Rank signifies more frequent participation in the behaviors from the scale.
[c]Probability of Superiority (PS) measured effect size as it does not expect nor require equal and normal distribution of data.
[d]Scale 1 = *Affective Responsiveness;* Scale 2 = *Training and Play;* Scale 3 = *General Care.*

the relationship being formed. However, as Pierce (2016) demonstrates, many parents who obtain companion animals are doing so to help their children learn caretaking behavior. This would suggest an understanding of the importance of animal welfare and some level of autonomy necessary in caring for companion animals. It is unlikely that parents who do not perceive the general welfare of animals as worthy of consideration would invest in the necessary food, toys, veterinary care, and other needs of companion animals in the home. Likewise, a connection between animal welfare and child welfare began to develop in the Victorian era (Turner, 1980), and continues to be found in numerous studies (DeMello, 2021).

In addition to the *People Substituting* and *Generalized Attachment* scales of the LAPS, the first scale of the CARES (*Affective Responsiveness*) measures bonding and affection type behaviors, as well as the overall negotiation of the relationship and needs between human and companion animal. Nonparents reported higher frequencies of these behaviors, which makes sense if we view pet parenting as alloparenting of nonhuman companions. These statements focus primarily on demonstrating affection ("I hug/cuddle my pet"), ascribing autonomy and decision-making opportunities to companion animals ("I let my pet request play/walks from me") and including the animal's needs when making financial choices ("I consider my pet when paying bills/making a budget" and "I leave work/stay home sick if my pet is sick"). This demonstrates that nonparents investment in companion animals is more than the exchange in a pet as fancy or status. Rather, their decision making is being altered by the needs of their companion animals. These behaviors closely parallel the financial and time investments of parents and are indicative of similar emotional bonds to those shared between parents and their children ("I console my pet when they are upset/nervous/scared"). This further supports the overlaps between parenting and pet parenting.

Nonparents reported higher frequencies of the behaviors in *General Care.* If parents are obtaining companion animals primarily so children can learn to care for others, it stands to reason the children are the ones providing direct care such as feeding, grooming, and exercising their companion animals. In contrast, if rather than having children, nonparents are investing in the direct care of their companion animals, these caretaking duties would fall upon the guardian directly whether by choice or necessity. Without children to aid in caretaking behaviors, nonparents must do all the feeding and grooming. However, these individuals are more likely engaging in these duties specifically because they help create a bond between companion animal and guardian through the release of hormones such as oxytocin and suppression of cortisol (Handlin et al. 2012).

Like *Animal Rights/Welfare* on the LAPS, there was no statistically significant difference between nonparents and parents on the scale *Training and Play* on the CARES. In fact, of the two instruments, this is the scale on which nonparents and parents were most strongly aligned ($U = 82{,}870$; $p = .710$). Initially, I expected that nonparents, adopting their role as pet parenting, would invest more in these behaviors specifically because of the "teaching" role they require. For example, this scale includes statements such as "I engage in training activities with my pet" and "I take my pet to training classes." Though parents may be invested in a well-behaved companion animal for different reasons (e.g., the safety of their children or the avoidance of legal fees from an incident), it does make sense they, too, would invest in the training and socialization of their companion animals. This also supports the lack of difference on *Animal Rights/Welfare* since neither parents nor nonparents would welcome the loss of a companion animal due to a preventable behavior problem.

Ultimately, this study provides two important conclusions. First, nonparents appear to become more bonded to, and in some ways, more invested in the care of their companion animals when compared to parents. More specifically, the display of attachment and affectionate responsiveness, along with the negotiation of companion animal autonomy and consideration of their companion animal's specific needs and preferences, is higher. This may be because they do not need to invest that financial, emotional, or time budget into the care of biological offspring. Second, there is significant overlap between nonparents and parents in many of the ways they interact with and invest in companion animals. This further supports the possibility that we have evolved, not specifically to parent, but to nurture others—even those of another species. Granted, more work needs to be done to validate the model of parenting (defined as nurturing others) as a variable, species-level trait.

Future work may benefit from a more specific focus on Tinbergen's Four Questions (Tinbergen, 1963) when considering the plasticity of human caregiving and attachment. While this study loosely investigated the interplay of ontogeny and plasticity with adaptive value, it did not directly seek to explore pet parenting via Tinbergen's framework. Preston (2013) suggests in-depth ways to explore ultimate and proximate levels of offspring care that may map on to pet parenting. For example, mechanisms related to neurological (e.g., Berns

et al., 2014) and hormonal (e.g., MacLean & Hare, 2015) have already been identified in humans and dogs. Likewise, case studies and media accounts suggest pet caregiving in other apes (e.g., Koko the gorilla kept a kitten). A more direct emphasis on pet parenting within Tinbergen's framework may uncover a richer, more nuanced story to the history of this emerging practice.

Despite this, it appears that when nonparents engage in conversations about their companion animals, make decisions about financial investments, and alter their work or personal plans, they are doing so in ways that mirror the choices of their childed counterparts. This is certainly not the case for every individual who claims the moniker "pet parent," as trends and their related behaviors come and go. However, there is certainly a group of individuals, as demonstrated by this study, who are making a reproductive trade-off that still allows them to have a nurturing, personal relationship with their companion animals that is different that simple "pet ownership."

Conclusion

All research, no matter how carefully completed, suffers from limitations. In the case of this study, some of these limitations relate to the generalizability of this sample. As noted in the Results, the population is largely female, heterosexual, white, and educated. Therefore, additional data need to be collected before we suppose other cultures, genders, or socioeconomic or ethnic groups are experiencing a similar trend. Likewise, the scales used, one well established, the other created for this survey, may require further validation to establish their use in this way. However, I believe they both do well to measure, sometimes by proxy, the general companion animal affection, attachment, and caretaking behavior differences between parents and nonparents.

This research needs to be expanded to better understand whether the 2DT is contributing to these changes. Cross-cultural data would aid in determining the impact of experiencing or recently transitioning out of the 2DT. Accordingly, I have begun to collaborate with colleagues in India, Finland, and Japan to collect additional data, with hopes to include China, South Korea, and at least one African or Middle Eastern country within the coming years. If it appears that the 2DT does play a role in this change, it would be imperative to consider how the nuance of different cultural contexts structures the relationships between nonparents and companion animals, as well as the role of companion animals in homes with children.

For now at least, in the United States, it appears that life-history trade-offs are no longer as simple as a choice between available resources and reproduction. Or at the least, we can reframe "resources" to mean more than energy budgets, food, and money. Rather, a portion of the population is choosing not to have children, instead investing in deeply bonded relationships with companion animals that in many ways mirrors the parent-child bond.

Ethics Approval

This project was approved by the Boise State University IRB (Protocol #041-SB19-272). All participants acknowledged consent before completing the survey, and informed consent was captured as question IC in the raw dataset.

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