

Spouses and cats and their effects on human mood

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Abstract

*Previous data indicated that cats influence the moods of singly living people only by decreasing negative moods, while not affecting positive moods. In this study, we asked if such an effect can be 1) replicated, 2) is comparable to the effect of a human partner, and 3) related to the owner's attachment towards the cat. Two hundred and twelve couples with cats, 31 couples without cats, singly living people with cats (47 women, 45 men) and singly living people without cats (43 women, 9 men) volunteered to participate. We used a list of adjectives (the "EWL"-Questionnaire) to assess their mood, which they responded to on an evening of their choice. The Lexington Attachment to Pets Scale (LAPS) was additionally completed by the cat owners. Selected adjectives were reduced by factor analyses and labeled *bad mood*, *activity*, *good mood*, and *seclusion*, according to the highest loadings of mood items within each factor. Each mood factor was explained by cat ownership, presence or absence of a partner, and the person's sex. Further, sex, partner status and attachment towards cats explained moods amongst the cat owners. Only the partner, but not the cat, enhanced positive moods. Cats alleviated negative moods, and this effect was comparable to the effect of a human partner. This compensatory effect of cat ownership on negative moods was not comparable to a similar effect of degree of attachment towards the cat on human mood. Possible reasons for the unidirectional effect of cats on human mood are discussed.*

Keywords: attachment, cats, gender, human mood, marital status

It was recently found that cats have an impact on their owner's current mood (Rieger and Turner, 1999). Interestingly, the presence of a cat was only related to lowered negative moods; there was no effect on positive moods. This suggests that the cat's beneficial influence on moods is limited to compensating for negative moods. However, all the

Note: Rieger and Turner were equally involved in this study

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participants in that study were singly living, and it is theoretically possible that this effect was unique for this group. The current study investigated whether this unidirectional effect could be replicated and whether the effect of a cat was comparable to the effect of a human partner. It further compared effects of cat ownership with the influences of level of attachment towards cats on human mood.

Mood states and mood traits

The way someone feels at a specific moment and how he or she feels in general are not necessarily the same. The way a person feels for a short period of time is defined as his or her affective *state*; however, if a certain mood is a more stable part of that person's personality, it is defined as an affective *trait* (Larsen 2000). The present study focuses on the impact of cats on mood *states*.

Spielberger and his colleagues validated the differences between mood states and mood traits. They extracted the differences between state- and trait depression (Krohne et al. 2002), state- and trait anxiety and state- and trait anger (Spielberger, 1985; Spielberger et al., 1999). However, an affective state can be related to its corresponding affective trait (Johnson and Tversky 1983; Zelenski and Larsen 1999, 2002). Furthermore, mood states can influence the corresponding traits over time, e.g., increased depressive states promote a more neurotic personality (Griens et al. 2002). As a consequence, mood states can affect general psychological well-being (Costa and McCrae 1980) and even physiological health (Costa et al. 1982). The sum of mood states over a period of time is therefore seen as an indicator of well-being, and its regulation is desirable (Larsen 2000). Given this, it is of interest to investigate what influence a pet can have on an owner's mood states.

Pet ownership and well-being

In recent years, a number of studies have attempted to explain the influence of companion animals on owner well-being. Owning or interacting with a pet seems to aid child development, to improve psychological well-being, to buffer against emotional stress, and to enhance physiological health (Wilson and Turner 1998; Fine 2000; Podberscek, Paul and Serpell 2000). However, a positive impact on human well-being has not always been demonstrated. Reasons for this might be that different populations have been studied and that different measures and experimental designs have been employed (Garrity and Stallones 1998). Still, most studies indicate that pet ownership affects human well-being in a positive way.

Relatively few studies have explicitly focused on the effects of pets on human mood states. Three studies used the Spielberger State-Trait Anxiety scale (Spielberger et al. 1970). Two of these found no differences in state anxiety between participants who owned pets and those who didn't (Straede and Gates 1993; Watson and Weinstein 1993). The third study suggests that any effects of interactions with a dog on state anxiety could also be reached by other means (Wilson 1991). Another study found that time spent with pets was related to negative mood states in men but not in women (Staats and Horner 1999). Thus, information on how pets can influence mood states is inconclusive.

Regarding the human-cat relationship, human behavior towards cats was found to be linked to both positive and negative moods at a certain point in time (Turner and Rieger 2001). However, a decrease in negative moods over a longer time period was exclusively related to cat ownership, whereas positive moods were not affected (Rieger 1998; Rieger and Turner 1999). Rieger and Turner (1999) also found that cat owners experienced fewer negative mood states than non-owners, but that they didn't differ in positive moods. Replication of this latter finding is desirable.

The current study also compares the effects of cats on mood with the effects of human partners on mood. Companion animals have been found to have positive influences on human physiological measures in certain stressful situations, while partners have had a less pronounced or even negative effect (Allen et al. 1991; Allen 1998). It is possible, perhaps even probable, that a similar difference exists between the effects of cats and partners on human mood. Human partners can presumably influence the entire palette of moods, even by increasing negative moods, whereas the cat—based on the previous study—might indeed only decrease negative moods.

Attachment towards pets

A common model to explain the effects of pet ownership on well-being is attachment theory (Ainsworth 1969; Bowlby 1978). Attachment to a pet is compared with the dynamics in a parent-child relationship, based on the child's feelings of security toward the parent. Consequently, attachment to companion animals might also have positive effects on human well-being. Attachment towards pets seems to be beneficial for child development (Paul and Serpell 1996; Melson 1998; Triebenbacher 1998), has positive effects on psychological well-being, and may act as a buffer against emotional distress (Garrity et al. 1989; Keil 1998; Colby and Sherman 2002). However, studies of pet attachment don't always find significant relations

with human well-being, even though the same studies might find positive relationships between pet ownership and well-being (Zasloff and Kidd 1994; Van Houtte and Jarvis 1995). Reasons for this discrepancy might again be that different methodologies have been used in the different studies. But it has also been suggested that attachment style can vary between individuals and therefore produce different outcomes (Colby and Sherman 2002), and that attachment can work differently for different populations (Stallones et al. 1990).

With respect to cat ownership, attachment seems to be an effective mechanism: in one study, people with fewer significant others were found to be most strongly attached to their cats (Stammbach and Turner 1999). Furthermore, more reciprocal behavior between the owner and the cat was found for those human–cat pairs, where the owner was strongly attached to the cat but experienced little social support from other humans (Kannchen and Turner 1998; Turner 2002). Given these correlates, it seems plausible that attachment towards cats could also be related to human mood.

Study goal

The main goals in this study were to investigate whether the cat's effect solely on negative mood states could be replicated and how the effect on human mood states compares with the effect of a human partner. We hypothesized that bad moods will be positively influenced by a cat (by reducing them). Contrarily, a human partner might influence both good and bad moods, but possibly in different ways, e.g., by even increasing bad moods. Finally, we investigated whether the relationship between cat ownership and mood is comparable to the relationship between the degree of attachment to the cat and its effect on human mood.

Methods

Recruitment and study sample

Via advertisements in the newspaper, on radio and on television, we sought voluntary participants living in and around the city of Zurich, Switzerland. We called for participants who would fall into one of the following four categories: 1) People who had a human partner and were current cat owners, 2) People who had a partner but were non-owners, 3) Singly living people who owned a cat, and 4) Singly living people without a cat. The participants either had to have been living together with their partners for more than six months, or they had to have been single and living without another human for at least six months. The same time conditions were set

for cat owning and non-owning persons. Cat owners could have no more than two cats and there were to be no other pets present in the household. People who didn't own cats were asked whether they had ever owned a pet in the past.

Of the 212 couples who participated and owned cats, the women had mean age of 45.4 years ($SD=11.1$) and the men had a mean age of 48.3 years ($SD=13.7$). Of the 31 participating couples without a cat, the women had a mean age of 45.2 years ($SD=13.7$) and the men had a mean age of 47.3 years ($SD=13.7$). Forty-seven women lived alone but owned a cat (mean age=46.4 years, $SD=16.9$) and 43 women lived alone without a cat (mean age=50.1 years, $SD=13.1$). Forty-five singly living men had a cat (mean age=45.3 years, $SD=11.7$) and nine singly living men had no cats (mean age=52.8 years, $SD=15.5$). Fifty-one of the 114 non-owners never had a pet.

Materials and procedure

Two questionnaires were sent to the participants: one about their mood states and one to assess attachment to their cats.

The first questionnaire was the "EWL" (German abbreviation for "list of adjectives," Janke and Debus 1978). This test was specifically designed to measure mood states rather than traits. The EWL has moderate to high reliability and moderate validity. Participants could freely choose the day upon which they wanted to fill out the form. The time of day, though, had to be 21.00h, as people are more likely to feel a variety of moods in the evening (Janke and Debus 1978). Within couples, both partners had to complete an EWL, but independently of each other. Out of the 123 adjectives in the list, the participants had to mark as quickly as possible whether a given adjective applied to their current mood. An adjective that was marked was later assigned by the authors to one of 14 mood sub-scales, as evaluated by Janke and Debus (see Table 1; for examples of the adjectives, see Turner and Rieger 2001).

Participants with cats completed a second questionnaire, the Lexington Attachment to Pets Scale (Johnson et al. 1992). The LAPS consists of 23 questions about the owner's feelings and opinions about pets in general and his/her pet in particular. Answers to each question were rated from "no agreement" to "high agreement" on a 4-point scale, and a total score over all answers was then calculated. Here, the validated German version of the LAPS was used (Kannchen and Turner 1998; Stambach and Turner 1999). Participants were instructed to complete the LAPS immediately after the EWL.

Data reduction

Some of the 14 mood sub-scales measured similar dimensions (e.g., depression and anxiety). To reduce these related moods to an interpretable number, sub-scales were first subjected to a principal component analysis (PCA). For both within men and within women, the first four mood components showed the biggest contributions to the explained variance (cumulative variance equaled 70% and 72%, respectively). The loadings in the corresponding PCs of men and women were highly correlated (Kendall-Tau's were 0.9, 0.9, 0.7 and 0.8, respectively). This indicates that these four mood components reflected very similar moods in both sexes.

For the couples, there was the possibility that their moods were not independent. Such an effect could confound further results. Thus, we randomly split the couples into two groups of the same size. We then related the mood components of one half of the paired women to the mood components of their own partners. In the same statistical model, the moods of the other half of paired women were related to the moods of unrelated (but coupled) men. Thus, we compared the second half of women with men with whom they were not paired. We found that the four mood components of women and men were not more strongly related to each other when women were compared to their own partners than when compared to strange men, ($F_{(1,238)}=1.3, p=0.3$; $F_{(1,238)}=0.4, p=0.8$; $F_{(1,238)}=0.9, p=0.4$; $F_{(1,238)}=1.0, p=0.4$, respectively). This suggests that the couples in this study were not more alike in their moods compared to unrelated men and women. Thus, men and women of couples were treated as independent data points in the analyses.

We conducted a further PCA of the mood scores but this time we merged the sexes because their mood components were very alike (see above). Such a procedure allows establishing more reliable mood components. As expected, the first four PCs showed the largest contributions to the amount of variance explained (cumulative variance = 71%). These PCs were subjected to a varimax-rotation. The resulting factors were labeled *bad mood*, *activity*, *good mood*, and *seclusion*, according to the highest loadings of the 14 mood sub-scales within each factor (Table 1). The first factor covered most of the negative moods. The second factor covered activity in contrast to inactivity, tiredness and dizziness. The third factor had high loadings in self-confidence, good mood and extroversion. The final factor was best explained by seclusion, but had additional high loadings on touchiness.

A multiple linear regression analysis did not show a significant relationship between age and the four moods ($F_{(4,625)}=1.8, p=0.12$). Using a logistic regression procedure, no mood differences were found between

Table 1. Factor Analysis of Mood and Factor Loadings for each Mood State

Mood-subscale	FACTOR			
	Bad mood	Activity	Good mood	Seclusion
Activeness	0.36	0.58	0.53	-0.03
Inactiveness	0.16	-0.83	-0.23	0.15
Tiredness	0.22	-0.67	-0.26	0.27
Dizziness	0.09	-0.84	0.08	0.00
Extrovertedness	-0.12	0.26	0.78	0.26
Introvertedness	0.41	-0.44	-0.41	0.14
Self-confidence	-0.23	-0.02	0.78	-0.29
Good mood	-0.27	0.15	0.86	-0.10
Agitation	0.82	-0.07	-0.09	0.16
Touchiness	0.43	-0.03	-0.17	0.62
Anger	0.84	-0.13	-0.15	0.00
Anxiety	0.49	-0.12	-0.26	0.54
Depressiveness	0.66	-0.23	-0.39	0.33
Seclusion *	-0.02	-0.21	0.10	0.83
%Variance explained	19.7	18.6	20.1	12.7

* The exact translation of this mood would be "dreaminess." However, we consider this misleading, given that this mood covers predominantly negative feelings, which reflects an inner withdrawal.

non-owners who never had a pet and those who once owned a pet ($\chi^2=7.3$, $p=0.12$). Therefore age was not included in further analyses, and pet ownership was dichotomized into having a cat/not having a cat. However, women had more feelings of seclusion than men ($F_{(4,625)}=7.3$, $p<0.001$), and therefore sex was included in further analyses.

Results

Cat ownership and mood

To explain the effect of mood on behavior, multiple linear regression analyses were performed (which were technically common analyses of variance, ANOVA). Each of the four mood components was explained by a 2 (no partner/partner) X 2 (no cat/cat) X 2 (female/male) model (Table 2, p. 220).

Bad mood: Owning a cat was significantly related to lower reporting of bad moods. Partner status had no main effect on bad mood. However, this finding was moderated by the interaction between having a partner and owning a cat (Figure 1): singly living people without a cat experienced a bad mood more often than anyone else. Subsequent contrast analyses

Table 2. Multiple Linear Regression Analyses: Partner Status, Cat Ownership and Sex as Predictors of Mood

Predictors	Bad mood		Activity		Good mood		Seclusion	
	B	t	B	t	B	t	B	t
Partner ¹	-0.07	-1.18	0.07	1.06	0.22	3.55**	-0.17	-2.82**
Cat ²	-0.19	-3.03**	0.01	0.20	0.08	1.28	-0.27	4.43***
Partner & Cat	0.25	4.10***	-0.08	-1.27	-0.01	-0.10	0.16	2.62**
Sex ³	0.10	1.61	0.03	0.46	0.05	0.82	-0.14	-2.30*
Cat by Sex	-0.07	-1.18	0.00	-0.04	-0.01	-0.18	-0.09	-1.52
Partner by Sex	-0.03	-0.46	-0.05	-0.75	0.01	0.13	0.00	0.03
Partner & Cat by Sex	0.10	1.57	-0.02	-0.27	-0.01	-0.15	0.08	1.31
<i>Model</i>								
Ad. R ²	0.03		0.00		0.05		0.08	
F (7, 622)	3.6**		0.6		4.4***		8.5***	

1 = Single vs. paired; 2 = cat owner vs. non owner; 3 = female vs. male.

B = Regression coefficient; t = t-value; Ad. R2 = Adjusted R square; F = F-value with degrees of freedom. * = p < 0.05. ** = p < 0.01. *** = p < 0.001.

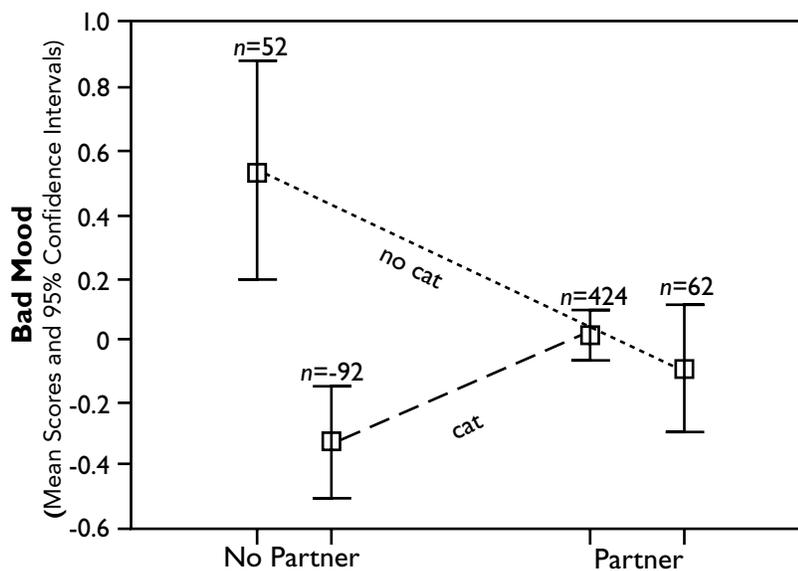


Figure 1. Effects of partner status and cat ownership on bad mood, after controlling for the person's sex. Values on the y-axes are of the newly created factor and are only meaningful in relation to each other.

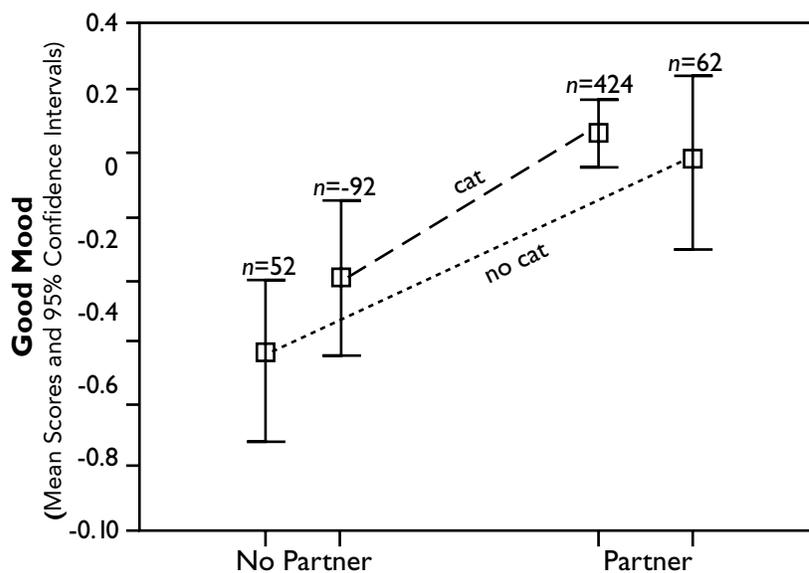


Figure 2. Effects of partner status and cat ownership on feelings of good mood, after controlling for the person's sex. Values on the y-axes are of the newly created factor and are only meaningful in relation to each other.

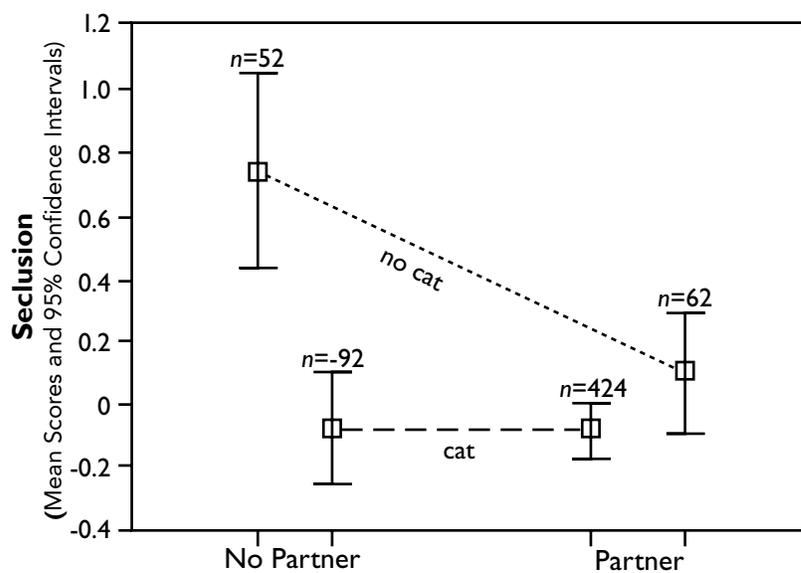


Figure 3. Effects of partner status and cat ownership on feelings of seclusion, after controlling for the person's sex. Values on the y-axes are of the newly created factor and are only meaningful in relation to each other.

emphasized this effect ($t_{(1,622)}=0.52, p<0.01$). Additionally, singly living people with cats were less often in a bad mood than people with both partners and cats ($t_{(1,622)}=-0.36, p<0.01$). This is surprising because singly living people with cats did not significantly differ from people with partners but no cats. Nor did people with both partners and cats differ from people with partners but no cats. This suggests that the difference found was not predominantly due to the partner or the cat but was only of significance if we compared singly living people with cats with people with both partners and cats. These effects applied to both men and women, given the insignificant interactions with the person's sex.

Activity: Neither the person's sex nor his or her partner status nor having a cat were related to feelings of activity (see Table 2).

Good mood: Having a partner was positively associated with good moods. This effect was independent of a person's sex, or whether he or she had a cat. Cat ownership had no significant effect on good mood (Figure 2).

Seclusion: Having a cat or a partner was related to having fewer feelings of seclusion. Singly living people without a cat were more seclusive than the others. This finding is illustrated in Figure 3 and was emphasized by subsequent contrast analyses ($t_{(1,622)}=0.87, p<0.001$). Effects did not significantly differ between men and women.

Attachment towards cats and mood

We then analyzed whether the relationships found between moods and cat ownership were also reflected by the degree of attachment towards a cat and its effect on mood. Within the group of cat owners, each mood component was predicted by attachment, partner status, sex and their interactions, using multiple linear regression analyses (Table 3).

Bad mood: Attachment towards cats did not affect bad mood, whereas having a partner did. Figure 1 already showed that people with partners and cats were more often in a bad mood than singly living people with cats. Interestingly, however, this effect was not even moderated by the level of attachment to the cat. Thus, even strongly attached cat owners experienced a bad mood more often if they had a partner. There were no significant sex differences.

Activity: There were no significant relationships between partner status, degree of attachment, a person's sex and feelings of activity (Table 3).

Good mood: Having a partner was positively related to good mood. However, it was especially the cat owners with partners who showed a strong positive relation between attachment towards cats and good mood

Table 3. Multiple Linear Regression Analyses: Partner Status, Cat Attachment and Sex as Predictors of Mood of Cat Owners

Predictors	Bad mood		Activity		Good mood		Seclusion	
	B	t	B	t	B	t	B	t
Partner ¹	0.17	2.80**	-0.04	-0.67	0.21	3.72***	0.01	0.15
Attachment	-0.60	-1.37	-0.01	-0.02	0.79	1.86	0.72	1.71
Partner & Attachment	0.76	1.74	0.20	0.44	0.94	2.21**	0.55	1.29
Sex ²	0.06	1.07	-0.04	-0.65	0.09	1.51	-0.09	-1.61
Cat by Sex	0.04	0.64	0.01	0.11	0.02	0.27	-0.01	-0.19
Partner by Sex	-0.14	-0.33	0.37	0.79	0.23	0.55	-0.56	-1.31
Partner & Attachment by Sex	0.20	0.46	-0.82	-1.76	-0.32	-0.76	0.35	0.82
<i>Model</i>								
Ad. R ²	0.04		0.00		0.07		0.04	
F (7, 622)	2.7**		0.6		5.2***		3.4**	

1 = Single vs. paired; 2 = female vs. male.

B = Regression coefficient; t = t-value; Ad. R² = Adjusted R square; F = F-value with degrees of freedom. * = p < 0.05. ** = p < 0.01. *** = p < 0.001.

(as indicated by the interaction between partner status and degree of attachment; see Table 3).

Seclusion: There was no significant relation between degree of attachment and feelings of seclusion. Neither was the person's sex nor partner status related to seclusion.

Discussion

Cat ownership and mood

The cat's effect seems to be unidirectional—by reducing negative moods, but not by increasing positive moods. Cat ownership was related to fewer experiences of bad mood and fewer feelings of seclusion. Human partners had similar effects on these negative moods. However, if a human partner was present next to the cat, then his or her decreasing effects on these negative moods were not particularly amplified. It therefore seems as if cats and partners are interchangeable in terms of reducing the experiences of bad moods and seclusion. Interestingly, for bad mood, having a cat only, instead of both a partner and a cat, appears to be even more effective, as we will discuss below. In general,

however, singly living people without cats were found to be more often in a bad mood and were more seclusive than the other participants.

With respect to bad mood, there was also a noticeable difference between two of the cat owning groups: singly living people with a cat were less often in a bad mood than cat owners with a partner. Yet, there were no substantial differences between the other cat owning groups (Figure 1). Thus, the difference found between singly living people with cats and cat owners with partners was *not* due to an overall negative effect of having a partner and a cat; it was a specific effect if only these two groups were compared. The following mechanism might have been at work: cats alone and partners alone had similar effects on bad mood, but the compensatory effects of a cat were (significantly) lost if a partner was added, while the effects of a partner were not substantially influenced if a cat was added (Figure 1). We hypothesized that partners could contribute to someone experiencing a bad mood, but we have no strong argument why this should be the case, if only singly living people with cats are compared to people with partners and cats. The reasons for this effect are unclear and require further study.

With respect to good mood, it seems that having a cat affected mood differently from a human partner. Only having a partner enhanced good mood; here the cat was ineffective. Overall, a cat is as good as a partner at reducing the frequency of bad moods, but people don't seem to experience higher frequencies of good moods without a human partner.

Feelings of activity were not affected by cats or partners. Activity is related to one's degree of productivity (Janke and Debus 1978) but is not necessarily related to other living beings. This might explain why neither cats nor human partners were influential with respect to this mood.

Attachment towards cats and mood

The effects of attachment to their cats on the owners' mood were not directly reflected in the aforementioned effects of cat ownership. Neither bad mood nor seclusion were affected by attachment. Furthermore, the increased bad moods of cat owners with partners were not moderated by the degree of attachment towards their cats. Summarizing, it would appear that a partner and a cat have interchangeable effects on bad mood, but with respect to the cat effect, the degree of attachment to the cat plays no role. Similarly, both a partner and a cat reduce feelings of seclusion, but for the cat effect this mechanism does not depend on the degree of attachment to the cat.

Good mood was positively related to stronger attachment to the cat, but even more so if the person had a partner. One possible explanation is that the relationship between attachment towards cats and good mood is

more dependent upon the human partner than the cat. We already reported that an increase in experiences of good moods was only linked to having a partner but not to cat ownership. It seems therefore plausible that a partner increases good mood, which might make the person more prone to indicate stronger attachment towards the cat.

Conclusion and limitations

Assuming the aforementioned results are reliable, why do cats mainly reduce the experiences of bad moods and not increase the experiences of good moods? We are unaware of any theory which might explain this. Attachment towards the cat was apparently not involved, but even if it were, it would still be unclear why only negative moods (bad mood and seclusion) are influenced by the cat. Perhaps the cats are distracting their owners from their emotional distress, just as reading a book or listening to music does. Such activities may influence mood, but the effects will be limited compared to those resulting from interactions with other humans. Perhaps music and books also only reduce negative moods and do not enhance positive moods? A study related to this question looked at the effects of hobbies and dogs on well-being (Collis et al. 1998). However, it found that hobbies, including dog-owning, were only linked to fewer psychological problems when interactions with humans were involved. Therefore, the study did not provide evidence that a pet per se, similarly to a hobby, could decrease the experiences of bad moods. It was only those hobbies which involved other people, which seemed to be effective.

An extended study should therefore investigate whether the effect of cats compensating bad moods is comparable with the effect of other companion animals and other activities. A follow-up should also take into account different attachment styles, both towards pets and human partners. Further, some attachment styles (e.g., secure, anxious ambivalent) have been shown to increase positive human mood after interacting with an animal, whereas another attachment style (fearful avoidant) increased negative moods (Colby and Sherman, 2002). The present study did not differentiate between these, and this might have obscured any relationship between attachment and mood in our study.

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