



FlashReport

“Man's best friend:” How the presence of a dog reduces mental distress after social exclusion

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ABSTRACT

A substantial amount of research shows that social exclusion is a threat to mental health. In the research reported here, we tested the hypothesis that the presence of a companion animal can serve as a buffer against these adverse effects. In a controlled laboratory experiment, we found that only socially excluded participants who *did not* work in the presence of a dog reported lower mental well-being compared with socially excluded participants who performed in the presence of a dog and participants who were not socially excluded. The theoretical and practical implications of these findings are discussed.

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The bond with a true dog is as lasting as the ties of this earth will ever be.

Konrad Lorenz (1903–1989)

Introduction

In recent years, a body of research has illuminated the health benefits of human–animal interaction. One intriguing finding is that the presence of a companion animal such as a dog can reduce the owner's feelings of loneliness and isolation (Allen, 2003; Hendy, 1987; Mahalski, Jones, & Maxwell, 1988; Wells, 2007, 2009). The presence of a companion animal can promote physical and mental well-being by improving morale (Banks & Banks, 2002), increasing confidence and self-esteem (Folse, Minder, Aycock, & Santana, 1994; Hart, 2006), and lowering psychophysiological responses to stress (Allen, Blascovich, & Mendes, 2002; Hendy, 1987).

The extant research must be interpreted with caution because questions have been raised about its internal validity and replicability (Herzog, 2011). Most of the available data come from counseling or therapeutic settings, such as hospitals, nursing homes or penal institutions (Barker & Dawson, 1998; Moody, King, & Rourke, 2002).

The use of special populations constrains the generalizability of the findings and the preponderance of correlational designs precludes causal inferences. To overcome these limitations, we designed a laboratory experiment to test the companion-animal hypothesis rigorously. We used a well-validated manipulation (the Cyberball game, Williams & Jarvis, 2006) to induce the experience of social exclusion, had a domestic dog (*Canis lupus familiaris*) play the role of companion animal, and recruited university students as participants to see if the companion-animal effect is generalizable beyond clinical samples.

Research on social exclusion

Over the past 20 years, research has demonstrated that perceiving oneself as excluded can create feelings of emotional distress and uncertainty, such as depressed mood, increased feelings of loneliness, decreased self-esteem, and finding less meaning in life (Baumeister & Tice, 1990; Eisenberger, Lieberman, & Williams, 2003; MacDonald & Leary, 2005; Zadro, Williams, & Richardson, 2004; for a recent meta-analysis by Blackhart, Nelson, Knowles, & Baumeister, 2010).

As a result of these aversive affective states, socially excluded people may exhibit increased aggressive behavior (Leary, Kowalski, Smith, & Phillips, 2003; Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007; Twenge, Baumeister, Tice, & Stucke, 2001). However, the threat of exclusion is more effectively countered with prosocial behavior. As people are primarily motivated to recover a state of social inclusion by affiliating and reconnecting with others (Gardner, Pickett, & Brewer, 2000), they seek connection with new sources of potential affiliation

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(Maner, DeWall, Baumeister, & Schaller, 2007), show increased selective attention to signs of social acceptance (such as smiles; DeWall, Maner, & Rouby, 2009), exhibit improved recognition of facial expressions (Pickett, Gardner, & Knowles, 2004), demonstrate increased adherence to family-related concepts (Aydin, Graupmann, Fischer, Frey, & Fischer, 2011),¹ and finally, they are more receptive to the idea of supernatural beings, especially personal and benevolent ones (Aydin, Fischer, & Frey, 2010; Epley, Akalis, Waytz, & Cacioppo, 2008). In summary, there is substantial evidence for the claim that feelings of exclusion heighten the motivation to detect and exploit potential sources of affiliation.

In the present research, we explore the generality of the affiliation effect. Specifically, we ask whether a companion animal may be a sufficient source of attachment and support for people who feel socially excluded. If so, the presence of such an animal may serve as a buffer against the adverse effects of social exclusion. One relevant experimental finding is that participants who are primed with social disconnection become more likely to attribute humanlike mental states to animals (Epley et al., 2008; Study 3). People appear to respond to the loss of social connections by creating new ones with non-human organisms, and may wind up more able to cope with the negative effects of feeling socially excluded. Other studies have shown that the mere presence of a companion animal offers short-term health benefits by ameliorating stress levels (Allen et al., 2002; Wells, 2007).

We designed an experiment to test the companion-animal hypothesis in a controlled environment. We selected the domestic dog as a suitable “confederate” on the assumption that humans are inclined to perceive dogs as sources of non-judgmental acceptance. We therefore hypothesized (1) that the mere presence of a dog will protect socially excluded individuals from a decrease in mental well-being, and (2) that general feelings of social acceptance mediate this buffer effect.

Method

Participants and design

Fifty women and 18 men (overall mean age: $M = 22.67$, $SD = 2.24$) were recruited at the University of Munich and randomly assigned to one of the four conditions of a 2 (exclusion status: high vs. low) by 2 (dog: present vs. absent) factorial design.

Materials and procedure

The experimenter welcomed each participant to the lab and presented a questionnaire calling for demographic information (gender, age, nationality). Participants then played a game of Cyberball (Williams & Jarvis, 2006) for 5 min. Participants were tested individually but were led to believe that they were playing with two other individuals who were taking part in the experiment via Intranet. The game was fixed to induce feelings of either social acceptance or exclusion (Zadro et al., 2004). The Cyberball game featured a total of 30 throws. Participants in the inclusion conditions received the ball about 10 times, whereas participants in the exclusion conditions received the ball twice at the beginning of the game but then never again.

Shortly after a participant finished the game, the experimenter left the lab saying she would be back in a few minutes. She asked the participant to use this time to start working on a questionnaire comprising a manipulation check (“How excluded did you feel while playing the ball-tossing game?”; 1 [*absolutely not*] to 10 [*very much*]) and items assessing the experience of positive (*happy, joyful, confident*, $\alpha = .78$) and negative (*sad, depressed, frustrated*, $\alpha = .87$) emotions

on a 7-point scale. Composite scores were used for analysis. When the experimenter returned, she asked the participant to continue with the questionnaire. In half the cases, she brought along a dog, whom she introduced as “Lilli.”² The dog then remained with the participant until the experiment was completed. In the other half of the cases (i.e., the control condition), the experimenter returned dog-less.

Dependent measures

To test the companion-animal hypothesis, we administered (a) the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985, $\alpha = .88$), (b) items measuring meaning in life, with separate axes focusing on (1) seeking meaning in life ($\alpha = .91$) and (2) the presence of meaning in life ($\alpha = .81$; Meaning in Life Questionnaire; Steger, Frazier, Oishi, & Kaler, 2006), and (c) the Rosenberg Self-Esteem Scale (Rosenberg, 1965, $\alpha = .85$) after playing Cyberball. We also asked participants to indicate their perceptions of being socially accepted after playing the Cyberball game using the following items: “I do not feel alone in my life”, “I feel that I am accepted in my social environment”, “I lack companionship”, “I sometimes feel lonesome”, “I do not feel close to anybody” and “There are hardly any people I can turn to” (the last four items were reverse coded; $\alpha = .75$). Finally, we presented the measures of positive and negative affect a second time ($\alpha = .85$ for positive emotions; $\alpha = .77$ for negative emotions). In order to control for pre-existing preferences for animals, we asked whether the participant owned a pet (yes vs. no). After completing the questionnaire, participants were thanked for their contributions and thoroughly debriefed regarding the study’s aim.

Results and discussion

Manipulation check

Participants in the social exclusion condition reported higher levels of feeling left out from the Cyberball game ($M = 7.51$, $SD = 1.83$) than participants in the social inclusion condition ($M = 3.00$, $SD = 2.06$), $t(66) = 9.48$, $p < .001$, $d = 2.33$. There was no significant effect of social exclusion on positive affect, but a significant effect on negative affect, indicating that socially excluded participants felt more negative after playing Cyberball ($M = 2.66$, $SD = 1.54$) than those in the social inclusion condition ($M = 1.93$, $SD = 1.23$), $t(66) = 2.16$, $p = .034$, $d = 0.53$.

Mental health variables

There were no significant main effects of either social exclusion (vs. inclusion) or presence (vs. absence) of the dog on the mental health variables, all $ps > .17$, with the exception of main effects of presence (vs. absence) of the dog on negative and positive emotions, $F_s > 8.00$, which were both assessed at the end of the experiment. Most importantly, a series of 2 (status of social exclusion: high vs. low) by 2 (dog: present vs. absent) mixed-model analyses of variance (ANOVAs) revealed significant interactions for the variables of life satisfaction, $F(1, 64) = 5.76$, $p < .05$; presence of meaning in life; $F(1, 64) = 6.02$, $p < .05$; self-esteem, $F(1, 64) = 8.01$, $p < .01$; general feelings of social acceptance, $F(1, 64) = 7.80$, $p < .01$, and positive emotions (at the second assessment point), $F(1, 64) = 4.29$, $p < .05$. No significant interaction was found for seeking meaning in life or negative emotions (at the second assessment point), $ps > .14$. Tables 1 and 2 respectively display the mean-level and correlational findings.

² Lilli is a two-year old female Maltese. During the whole experiment she was unleashed and was sitting, lying or sleeping, while the experimenter was sitting on a chair near the lab door. No participant expressed discomfort with this arrangement.

¹ This effect was only found for female participants (see Aydin et al., 2011).

Table 1
Intercorrelations between the dependent mental health variables.

	1	2	3	4	5	6	7
1. Life satisfaction	–						
2. Self-esteem	.65***	–					
3. Meaningful existence	.56***	.35**	–				
4. Search for meaning in life	–.24*	–.34**	–.16	–			
5. Feelings of acceptance	.72***	.70***	.43***	.24*	–		
6. Positive emotions ^a	.51***	.51***	.42***	–.25*	.54***	–	
7. Negative emotions ^a	–.44***	–.44***	–.22	–.008	–.49***	–.51***	–

^a Assessed at the second assessment point.

*** $p < .001$.

** $p < .01$.

* $p < .05$.

Table 2
Means and standard deviations (in parentheses) of variables as a function of inclusory status and the presence of a dog.

	Exclusion		Inclusion	
	Dog (n = 18)	No dog (n = 15)	Dog (n = 17)	No dog (n = 18)
Life satisfaction	5.33 (1.00)	4.40 (1.24)	5.11 (1.19)	5.55 (1.12)
Self-esteem	3.47 (0.29)	3.13 (0.52)	3.27 (0.50)	3.53 (0.40)
Presence of meaningful existence	4.97 (1.04)	4.04 (1.26)	4.69 (1.11)	5.08 (1.03)
Search for meaning in life	3.67 (1.41)	3.56 (1.73)	3.88 (1.64)	2.97 (1.38)
Feelings of acceptance	3.54 (0.39)	3.11 (0.49)	3.25 (0.45)	3.44 (0.56)
Positive emotions ^a	5.37 (0.86)	4.08 (1.11)	5.05 (0.85)	4.75 (1.05)
Negative emotions ^a	1.50 (0.58)	2.51 (1.21)	1.70 (0.68)	2.01 (1.21)

^a Assessed at the second assessment point.

As we had predicted an interaction with a specific pattern, we used planned contrasts for further analysis (cf. Rosenthal & Rosnow, 1985). As expected, socially excluded participants in the dog-absence condition (contrast weight: +3) provided lower ratings for living a satisfying life, self-esteem, perceiving life as meaningful, feeling socially accepted in the general social environment, and experiencing positive emotions than socially excluded participants in the dog-present condition (contrast weight: –1) or socially included participants in both the dog-present (contrast weight: –1) and the dog-absent (contrast weight: –1) conditions, all $F_s > 2.82$, all $p_s < .05$. There were no significant differences between socially excluded participants in the dog-present condition and either of the inclusion conditions (for an overview of the results, see Fig. 1).³ Supporting the generality of these findings, analyses of covariance (ANCOVAs) revealed no significant effects of pet ownership, gender or age on the two-way interactions reported above.

Mediation analysis

We also predicted that feelings of acceptance would mediate the effects of the experimental conditions on the remaining mental-health outcomes. Using procedures recommended by Preacher and

³ In Fig. 1, the dependent variables life satisfaction, presence of meaningful existence, self-esteem, feelings of being socially accepted and positive emotions were z-standardized and averaged to form a composite index of mental health score ($\alpha = .80$).

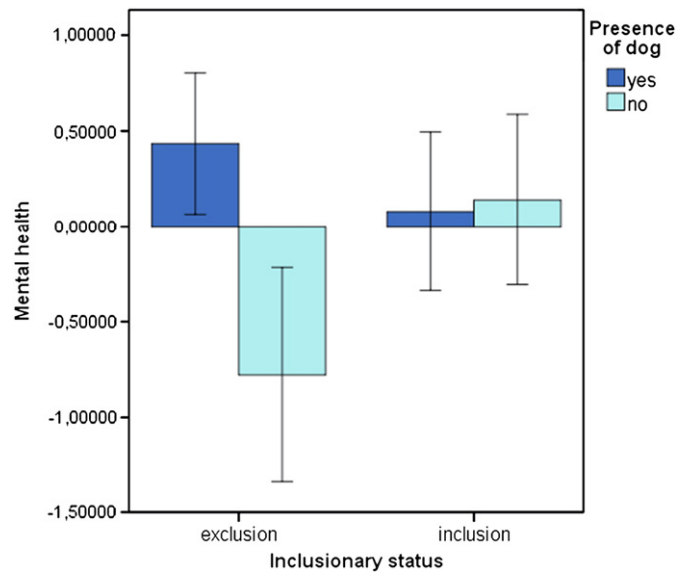


Fig. 1. The effect of inclusory status (exclusion vs. inclusion) and presence of a dog (yes vs. no) on self-reported levels of life satisfaction, the presence of meaningful existence, self-esteem, general feelings of acceptance and positive emotions (z-scores combined); error bars represent ± 2 SE.

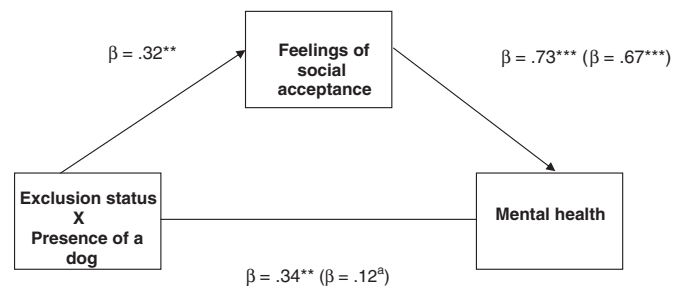


Fig. 2. Results of the mediation analyses for mental health. *** $p < .001$, ** $p < .01$, ^a $p = n.s.$

Hayes (2008), we treated the interaction term between the two independent variables as the predictor, scores on the acceptance scales as the mediator, and composites of the remaining mental-health variables as the criterion.⁴ The main effects of both independent variables were included as co-variates in the model. This analysis revealed a significant indirect effect, with a point estimate a^*b of .22 (bias corrected and accelerated 95% confidence interval = .07 to .38). Inclusion of the mediator reduced the uncorrected experimental effect ($\beta = .34$, $p = .003$) to nonsignificance ($\beta = .12$, $p > .14$), and the reduction in the regression weight itself was also significant; $z = 2.66$, $p < .01$; (see Fig. 2).⁵

Discussion

The current research began with the observation that the presence of a companion animal can benefit people who feel socially disconnected, such as the elderly or those who are hospitalized. Using an experimental approach and a non-clinical population, we showed that the mere presence of a dog is sufficient to decrease mental

⁴ The dependent variables life satisfaction, presence of meaningful existence, self-esteem and positive emotions (assessed at the second assessment point) were averaged to form a composite index of mental health score ($\alpha = .76$).

⁵ We also conducted an analysis to test whether positive emotions functioned as an alternative mediating variable on mental health outcomes (composite index of scores of life satisfaction, presence of meaningful existence, self-esteem and feelings of being socially accepted). Results indicated that positive emotions did not mediate the observed effect.

distress in individuals who had experienced social exclusion. Socially excluded participants who worked in the laboratory while a dog was present reported higher levels of life satisfaction, perceived meaning in life, self-esteem, and general feelings of social acceptance compared with socially excluded participants who were not exposed to a dog. This effect was localized and powerful in the sense that it was not moderated by pet ownership. Moreover, general feelings of acceptance mediated the dog effect, supporting the speculation that the projection of human qualities onto the animal may play a crucial role in the coping process after social exclusion. In other words, a constrained form of anthropomorphism seems effective in dealing with incidents of social exclusion. It also bears noting that Lilli, our confederate canine, had no prior association with any of the participants. Lilli was, in other words, an unfamiliar and thus “generic” representative of the category of companion animal.

Although the findings are clear and consistent, we caution against hasty generalizations of the stress buffering function of pets (cf. Herzog, 2011). Compared with a dog, a cat may stir lesser companionate feelings, and a parakeet still less. A task for future research is to delineate the boundary conditions of the present finding. The companion-animal effect might reduce to a companion-dog effect. Dogs, as Konrad Lorenz (1954/2002) and others have noted, are special. Since the dawn of the post-diluvian age, (wo)man and dog have co-evolved, arguably domesticating each other (Davis & Valla, 1978).

From an applied perspective, our finding calls for greater attention to the beneficial role of companion animals in therapeutic settings. It adds to research showing the value of service dogs to people with ambulatory disabilities or chronic diseases, and research showing the positive influence of dogs on human confidence, self-esteem and mental well-being (Allen & Blasovich, 1996; Wells, 2009). We suspect that pet-assisted therapy might be particularly effective in breaking the vicious cycle of isolation and depression that people living in clinical or penal institutions can experience.

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