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A Companion Dog Increases Prosocial Behavior in Work Groups

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ABSTRACT Although organizations use a variety of interventions to improve group functioning, getting people to work effectively with each other remains challenging. Because the presence of a dog has been shown to have positive effects on mood and dyadic interaction, we expected that the presence of a companion dog would also have positive effects on people in work groups. One reason for this is that a companion dog is likely to elevate positive emotions, which often promote prosocial behavior. In study 1 (n = 120) and study 2 (n = 120), participants were randomly assigned to either a dog-present or dog-absent four-person group. Three friendly companion dogs were randomly assigned to the dog-present groups; only one dog at a time was used during any given experimental session. In study 1, groups worked on an interactive problem-solving task; participants in the dog-present group displayed more verbal cohesion, physical intimacy, and cooperation. Study 2 was identical except that participants worked on a decision-making task requiring less interaction; participants in the dog-present condition displayed more verbal cohesion and physical intimacy and gave higher ratings of trustworthiness to fellow group members. In study 3, we examined behavioral indicators of positive emotions in dog-present and dog-absent groups. Naïve observers (n = 160) rated silent, 40-second video clips of interaction in groups where either a dog was (1) present but not visible or (2) not present. Behavior in dog-present groups was rated as more cooperative, comfortable, friendly, active, enthusiastic, and attentive. We discuss areas for future research and implications of our findings for work and educational settings.

Keywords: companion dog, prosocial behavior, small groups, work groups

When the Man waked up he said, "What is Wild Dog doing here?" And the Woman said, "His name is not Wild Dog any more, but the First Friend because he will be our friend for always and always and always." —Rudyard Kipling

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Groups and teams have become increasingly common in modern work and educational settings. In many organizations the focus of work has shifted from individuals to groups, often in response to complex problems where the generation of solutions requires diverse skills (Tannenbaum, Mathieu, Salas, & Cohen, 2012). In addition, the global and project-based nature of modern work has given rise to short-term work groups with diverse memberships. Thus, the ubiquity of groups, their diverse membership, and temporary nature make it all the more important that group members interact comfortably and do so quickly, without a lengthy and stormy adjustment process. Although organizations use a variety of interventions to improve work group functioning, getting to the point where group members work effectively together remains challenging and resource intensive. Unfortunately, most group development interventions (e.g., team building) tend to be infrequent and costly, and they typically occur in settings that differ from the actual performance environment (Klein et al., 2009). Interventions that are more continuous and present in the workplace may be more effective in nudging behavior toward desired ends (Thaler & Sunstein, 2008). Interestingly, something as simple as bringing a companion dog (*Canis familiaris*) to work may be such an intervention.

Although companion dogs are infrequently seen in today's work and educational settings, the presence of a dog often has positive effects on mood and interaction, generating an atmosphere where people behave in a more trusting, friendly, and cooperative manner. People appear happier, friendlier, and more relaxed in the presence of a dog (Rossbach & Wilson, 1992). Students shown pictures of college professors' offices with a dog, cat, or no animal perceived professors as more friendly and their offices as more comfortable when a dog was present (Wells & Perrine, 2001). The frequency of interaction with strangers increases when a dog accompanies an individual, even if he is dressed shabbily (McNicholas & Collis, 2000) or has a disability (Mader, Hart, & Bergin, 1989). People are also more likely to help a stranger who is accompanied by a dog, and men accompanied by a dog receive more favorable responses from women to courtship gestures (Guéguen & Ciccotti, 2008).

Most studies on human–dog interaction have been conducted with dyads during brief encounters; however, three streams of research and theory suggest that the presence of a dog should have a positive influence on human interaction and attitudes in small groups. These include our shared evolutionary history with the dog, the unique inter-species communication between people and dogs, and the influence of the dog's features and behaviors on human nurturing mechanisms. These more distal influences are, in turn, likely to influence positive emotions, which we argue may be key proximal mechanisms by which a companion dog influences prosocial behavior, trust, and intimacy in small groups.

Companion Dogs and Human Interaction

Shared Evolutionary History: For at least 15,000 years humans and dogs have had a unique symbiotic relationship (Vilà et al., 1997).[1] During this time dogs have been our guardians, helpers at work, and companions. Humans have influenced the dog's evolution through domestication, selective breeding, and by becoming its primary ecological niche. Dogs have influenced human evolution (Shipman, 2015), particularly the evolution of human cooperation (Schleidt & Shalter, 2003). Ethnographic and archeological evidence suggests that the domestication of dogs occurred, in part, because of the dog's value in cooperative hunting (Ruusila & Pesonen, 2004). Humans were able to cooperate in more complex ways with the use of dogs (Schleidt & Shalter, 2003). In particular, hunting strategies with dogs involved complex coordination, interaction, and communication. For example, dogs could flush and hold

game, allowing humans to develop coordinated efforts to obtain their prey. When early humans used dogs as hunting partners, they most likely increased their intake of protein (Koster & Tankersley, 2012; Ruusila & Pesonen, 2004). Thus, humans who kept, worked with, and *adapted to* dogs had a selective advantage over those who did not (Shipman, 2015).[2]

Inter-species Communication: Convergent evolution between humans and dogs sculpted our unique inter-species communication (Nagasawa et al., 2015). Both dogs and socialized wolves respond to human pointing cues, with relative success dependent on context and life history (Udell, Dorey, & Wynne, 2008). Dogs will readily gaze at a human's face and will follow the human eye gaze (Hare, Brown, Williamson, & Tomasello, 2002). Additionally, dogs recognize some human emotions and respond by mirroring them and displaying characteristics of empathy (Silva, Bessa, & de Sousa, 2012). For example, dogs appear to respond empathetically to signs of emotional distress in humans, even with strangers (Custance & Mayer, 2012).

Effects of Dogs on Human Nurturing Mechanisms: Some of the dog's behaviors—for example, attachment behaviors to caregivers and social referencing gazes—are similar to those of young humans (Rehn, McGowan, & Keeling, 2013). These similarities, as well as its neotenous features, may have allowed the dog to co-opt human nurturing mechanisms (Archer & Monton, 2011), which may trigger responses in humans *as if* the dog were a child. For example, people often speak in motherese to dogs in the same way they do to infants (Mitchell, 2001).

Companion Dogs, Positive Emotions, and Prosocial Behavior

Companion Dogs and Positive Emotions: Many of the dog's behaviors and the interactions that people have with dogs are likely to lead to positive emotions. More specifically, companion dogs can generate positive emotions by fostering social inclusion, acting as a social catalyst, increasing the perception of human likability, and activating physical and physiological mechanisms associated with positive emotions.

It is well known that social inclusion is associated with positive emotions and that social exclusion is associated with negative emotions (Blackhart, Knowles, Nelson, & Baumeister, 2009). Companion dogs are likely to foster social inclusion in several ways. People may feel more included, especially in a new group, simply by interacting with a dog (McConnell, Brown, Shoda, Stayton, & Martin, 2011). Friendly dogs often take the initiative in interacting with and showing affection toward people. The interaction with, and affection from, a dog can make people feel less isolated and more included.

A dog may function as a social catalyst—an engaging, safe, and neutral topic for opening a conversation—providing common ground for creating comfortable interaction. Furthermore, the dog's ability to attend to human cues and respond empathetically to human emotions may also allow the dog to stimulate social interaction (Graham & Glover, 2014). For example, a dog might stimulate human interaction by drawing people's attention to one another (McNicholas & Collis, 2000) by moving and responding empathetically to individuals who appear in distress or who are happy and animated.

A companion dog may also increase positive emotions in a group because people appear more likeable in the presence of a companion dog (Rossbach & Wilson, 1992; Wells & Perrine, 2001), and people experience more positive emotions in the presence of likeable people than unlikeable people (Rafaeli & Sutton, 1991). People may appear more likeable in the presence of a companion dog for a variety of reasons. For example, individuals in the presence of a dog

may seem less threatening and more approachable. People may perceive situations where a companion dog is present in a similar manner to those with adults and children—safe and friendly (Friedmann, Katcher, Lynch, & Messent, 1983). This may be particularly true for new groups, where people are unacquainted and anxious.

Finally, a dog may increase positive emotions through physical and physiological mechanisms. This can occur through affectionate touch and eye contact. Research shows that physical touch is linked to increased positive emotions (Fisher, Rytting, & Heslin, 1976; Whitcher & Fisher, 1979). For example, Vormbrock and Grossberg (1988) found that petting a companion dog lowers people's heart rate and blood pressure, making them feel calmer and relaxed. Affectionate mutual eye gaze is an indicator of liking (Kleinke, 1986), and mutual eye gaze between humans and dogs boosts oxytocin, which is associated with positive emotions (Nagasawa et al., 2015).

Regardless of how the dog increases positive emotions, a companion dog's effect on positive emotions is likely to spread throughout the group due to the common occurrence of emotional contagion in groups (Barsade, 2002). To the extent that the dog increases positive emotions within a group, this may create feedback loops, encouraging additional behaviors (e.g., touch, eye gaze, inclusive conversation) that further increase the likelihood of positive emotions.

Prosocial Behavior: In general, prosocial behavior can be defined as social acts that benefit or display concern for others (Penner, Dovidio, Piliavin, & Schroeder, 2005). In the workplace and in work groups in particular, prosocial behavior is commonly associated with cooperating, helping others, and spreading goodwill (George & Brief, 1992). Positive emotions often generate good will and altruistic behavior toward others, facilitating prosocial behavior. Numerous studies have shown a strong link between positive emotions and prosocial behavior (e.g., Levin & Isen, 1975; Rosenhan, Salovey, & Hargis, 1981). One way that positive emotions do this is by broadening the scope of thought and action (Fredrickson & Branigan, 2005; Michie, 2009). Positive emotions are also intertwined with trust (Dunn & Schweitzer, 2005), and people are more likely to be verbally and physically intimate with people they trust (Larzelere & Huston, 1980).

For this research we conducted three experiments. In studies 1 and 2 we examined how a companion dog might influence prosocial behavior, intimacy, and trust among members of small groups. We examined the effects of a companion dog in groups engaged in a problem-solving task (study 1) and a decision-making task (study 2). In study 3, naïve observers rated "thin slices" of behavior related to positive emotions in dog-present and dog-absent groups.

Study 1

In this study we examined the effects of the presence of a companion dog during a group problem-solving task. This involved a common goal and required group interaction.

Methods

Participants and Design: The sample consisted of undergraduate psychology students at a Midwestern university (n = 120); 81 were women and 39 were men. The mean age was 19 years. Participants were randomly assigned to one of two conditions: dog-present or dog-absent. Participants were pre-screened for allergies to and fear of dogs.

Procedure and Materials: Prior to data collection, this study was approved by Central Michigan University's Institutional Review Board (approval number: 102678-2). We obtained written and

informed consent from all participants. The animals used in this study were treated in a humane and ethical manner, and no animals were harmed during this research.

Participants were assembled into four-person groups. Groups in both conditions were asked to engage in a group-based problem-solving task in which their goal was to generate a 15-second advertisement and slogan for a fictional product. The task was designed to be intellectually demanding and relatively unstructured. The task also incorporated a strategy for effectively brainstorming creative solutions as a team (individual solution development prior to group solution development; Mullen, Johnson, & Salas, 1991). Group sessions were recorded using a JVC Everio digital video recorder.[3] At the beginning and end of each session, participants' heart rate and systolic and diastolic blood pressure were measured using an Omron HEM-790IT automatic blood pressure monitor. After each session, participants completed a 3-item group member satisfaction scale adapted from Tekleab, Quigley, and Tesluk (2009, $\alpha = 0.94$) and a 12-item interpersonal trust scale adapted from Johnson-George and Swap (1982; $\alpha = 0.85$). Both used 7-point Likert scales (1 = low; 7 = high).

Three friendly companion dogs were used in this study (a Jack Russell terrier, a medium-sized mixed breed, and a standard poodle). The dogs were randomly assigned to the dog-present groups; only one dog at a time was used during any given experimental (dog-present) condition. Each dog was off-leash during experimental sessions.

The video recordings were viewed and coded by six independent raters, where three raters were randomly assigned to code each participant. Raters indicated how frequently participants displayed the following behaviors: "cooperation" (physical or verbal behavior where an individual provides support to other individuals in the group either through physical gestures or by supporting or encouraging statements or ideas), "verbal cohesion" (verbal interaction between one team member and another related to creating or increasing bonding or closeness), "verbal intimacy" (verbal behavior where an individual makes himself or herself vulnerable to others in a manner that indicates an increase in trust between group members), and "physical intimacy" (physical interactions that reflect an attempt to create or increase closeness or bonding). Ratings were made on 5-point Likert scales (1= not at all; 5 = very frequently). Reliabilities (intraclass correlations) across raters ranged from 0.73 to 0.82. The definitions of the behavioral dimensions, sample behaviors, and rating anchors are in Appendix 1.

Results and Discussion

There was greater verbal cohesion, cooperation, and physical intimacy in the dog condition. Dog-present and dog-absent groups did not differ significantly on verbal intimacy, interpersonal trust, and group member satisfaction (Table 1).

Dog-present and dog-absent groups did not differ in pre-post heart rate (Wilks' Lambda = 0.974, $F_{(1, 118)} = 3.18$, $p = 0.08$); or diastolic (Wilks' Lambda = 0.997, $F_{(1, 118)} = 0.32$, $p = 0.57$) or systolic (Wilks' Lambda = 0.997, $F_{(1, 118)} = 0.31$, $p = 0.58$) blood pressure.

The results of study 1 indicate that a companion dog had a positive influence on several aspects of prosocial behavior. Most effect sizes were moderate. The largest effects were on cooperation and physical intimacy.

Study 2

In this study we examined the effects of the presence of a companion dog during a decision-making task. This was a mixed-motive task that required less group interaction than the problem-solving task in study 1.

Table 1. Effects of a companion dog in problem-solving groups (study 1).

	Dog		No Dog		Mean Difference		95% Confidence Interval of the Difference	
	M	*SD*	*M*	*SD*	*t (df)*	Cohen's *d*	Lower	Upper
Verbal Cohesion	3.27	0.77	2.87	0.91	–2.30 (90)*	0.47	–0.751	–0.054
Cooperation	3.59	0.75	3.10	1.17	–2.44 (90)*	0.50	–0.888	–0.091
Physical Intimacy	3.07	0.84	2.61	1.02	–2.38 (90)*	0.49	–0.848	–0.076
Verbal Intimacy	2.66	0.91	2.31	1.15	–1.63 (90)	0.34	–0.780	0.076
Interpersonal Trust	2.92	0.92	3.01	0.87	0.57 (118)	0.10	–0.236	0.428
Group Satisfaction	1.54	0.63	1.81	0.88	1.88 (118)	0.35	–0.0139	0.540

Observation ratings were on a scale of 1 (low) to 5 (high). Self-report ratings of interpersonal trust and group satisfaction were on a scale of 1 (low) to 7 (high).

*$p < 0.05$.

Methods

Participants and Design: The sample consisted of undergraduate psychology students at a Midwestern university ($n = 120$); 82 were women and 38 were men. The mean age was 20 years (not significantly different from the mean age in study 1). Participants were randomly assigned to one of two conditions: dog-present or dog-absent.

Procedure and Materials: Materials and procedures were identical to those used in study 1, except the task. In this experiment participants engaged in a decision-making task—a modified prisoner's dilemma game. They were presented with a scenario requiring them to make a choice either to cooperate or not cooperate with their group members. Individuals were to assume the following. They were accused of committing a crime together, arrested, and taken to jail; the police had insufficient evidence for a conviction; so the police separated each of the accused and offered each the following deal. "You have to decide whether or not to testify against the other three suspects. You can testify against the other three or you can remain silent. How things turn out for you depends on your decision and the decisions of each of the others." Each participant was presented with a payoff matrix showing the rewards. Each participant's decision to cooperate or not cooperate was private. The payoff matrix was similar to the original dyadic prisoner's dilemma payoff matrix, except that it was re-calibrated for four individuals. An individual would receive the highest payoff by not cooperating when others chose to cooperate. The second highest payoff would be when a participant chose to cooperate and all others also chose to cooperate. Reliabilities of behavior ratings (intraclass correlations) across raters ranged from 0.75 to 0.87.

Results and Discussion

Participants in the dog-present condition displayed greater verbal cohesion, physical intimacy, and interpersonal trust than those in the no-dog condition. Dog-present and dog-absent groups did not differ significantly on verbal cooperation, verbal intimacy, and group member satisfaction (Table 2).

Once again, dog and no-dog groups did not differ in pre-post heart rate (Wilks' Lambda = 0.996, $F_{(1, 118)} = 0.53$, $p = 0.470$); or diastolic (Wilks' Lambda = 0.987, $F_{(1, 118)} = 1.59$, $p = 0.21$) or systolic (Wilks' Lambda = 0.996, $F_{(1, 118)} = 0.52$, $p = 0.471$) blood pressure.

Table 2. Effects of a companion dog in decision-making groups (study 2).

	Dog		No Dog		Mean Difference		95% Confidence Interval of the Difference	
	M	*SD*	*M*	*SD*	*t (df)*	Cohen's *d*	Lower	Upper
Verbal Cohesion	3.09	1.09	2.69	1.02	–2.06 (118)*	0.38	–0.778	–0.015
Cooperation	2.51	1.05	2.34	1.13	–0.86 (118)	0.16	–0.567	0.224
Physical Intimacy	3.04	0.90	2.58	1.01	–2.66 (118)*	0.48	–0.810	–0.119
Verbal Intimacy	2.86	1.13	2.61	1.10	–1.27 (118)	0.22	–0.661	0.145
Interpersonal Trust	2.95	0.91	3.31	1.01	2.06 (118)*	0.37	0.013	0.710
Group Satisfaction	2.19	1.29	2.27	1.39	0.32 (118)	0.06	–0.407	0.563

Observation ratings were on a scale of 1 (low) to 5 (high). Self-report ratings of interpersonal trust and group satisfaction were on a scale of 1 (low) to 7 (high).

*$p < 0.05$.

Even though the task in study 2 involved mixed motives and less interaction than in study 1, a companion dog still had positive effects on prosocial behavior and trust. That trust was higher in the dog-present condition suggests that the presence of dog may increase trust levels in situations where trust is inherently problematic.

Study 3

In study 3 we examined a companion dog's effects on behavioral indicators of positive emotions. We compared ratings of dog-present vs. dog-absent groups when the dog was not visible to raters—naïve observers who viewed group interaction only briefly (40 s).

Methods

Participants: We recruited 160 participants using Amazon's Mechanical Turk (Mturk). Using a power analysis, we targeted a sample size of 150 participants, 75 in each condition. From an initial sample of 265, we removed 105 individuals for non-purposeful responding. Non-purposeful responding was indicated when a participant answered all questions with the same number or incorrectly answered a question to flag non-purposeful responding (e.g., "Answer this question with the number 3").

Procedure and Materials: We created "thin slice" video clips of group interaction from study 1 videos.[4] Eleven videos (6 experimental, 5 control), approximately 40-minutes in length, were originally edited. After removing sections of the videos where instructions were read and blood pressure was taken, we randomly selected eight 40-second thin-slice videos (out of the 33 thin slices taken)—four from the dog and four from the no-dog videos. We used videos from study 1 because the group task involved more interaction than the task in study 2. All of the stimulus videos were cropped above waist level, which prevented participants from seeing the dog. Control videos were also cropped to maintain similarity. The sound on the videos was muted. Pilot tests revealed that raters were unaware that a dog was present in the thin-slice videos.

The dependent variables in this study were behavioral indicators of positive emotions. Raters assessed group interaction on six indicators related to positive emotion (cf. Watson & Tellegen, 1985): cooperative, friendly, comfortable, active, enthusiastic, and attentive. They also reflect the broadening of the scope of thought and action that often occur with positive emotions.

Table 3. Thin Slice behavior ratings (study 3).

	Dog		No Dog		Mean Difference		95% Confidence Interval of the Difference	
	M	*SD*	*M*	*SD*	*t (df)*	Cohen's *d*	Lower	Upper
Comfortable	4.83	1.58	4.24	1.75	–3.11 (318)*	0.35	–0.949	–0.214
Cooperative	4.69	1.45	3.93	1.69	–4.30 (318)**	0.48	–1.102	–0.410
Friendly	4.84	1.47	4.13	1.86	–3.84 (318)**	0.43	–1.087	–0.351
Active	4.25	1.57	3.57	1.76	–3.65 (318)**	0.41	–1.049	–0.314
Enthusiastic	3.84	1.58	3.33	1.70	–2.80 (318)*	0.31	–0.873	–0.152
Attentive	4.50	1.61	3.99	1.73	–2.71 (318)*	0.30	–0.874	–0.138

*$p < 0.05$, **$p < 0.01$.

People are quite accurate at judging peoples' emotional states from facial expressions and other behaviors (Ekman, 1992), and their judgments can be accurate without personal interaction—for example, when viewing a videotape of an individual or individuals (Funder & Colvin, 1988). Each indicator was measured with a single item (e.g., cooperative), rated from 1 (not at all) to 7 (very much). Single-item descriptors are typical for thin-slices studies (Ambady & Rosenthal, 1993) because they are more amenable to rating brief episodes of behavior.

Each participant saw two videos. The videos were randomly assigned and counterbalanced so that people did not always receive the experimental or control video first. The participants were instructed to watch the first video once, and only once, and then rate the group interaction. They were then asked to repeat the same procedure for the second video. Each video was followed by the request to rate the group interaction on the six dependent variables. Questions to flag non-purposeful responding were included with the dependent measures.

Results and Discussion

Intercorrelations of the six dependent variables ranged from 0.34 to 0.62, with a mean correlation of 0.48. Mean ratings of the dog-present and dog-absent clips differed significantly on all six indicators (see Table 3), with the ratings being higher for all of the dog-present videos.

There were significant differences on ratings of cooperative, friendly, comfortable, active, enthusiastic, and attentive. These results indicate that a companion dog increased positive emotions among members of small groups, and that these effects were robust enough to be noticeable even though raters observed the interaction for only 40-seconds.

General Discussion

Groups and teams are increasingly common in today's work and educational settings; yet improving the quality of group interaction in these settings has remained difficult. Because a number of studies have found that a companion dog improves the quality of interaction in dyadic interaction, we sought to investigate whether a companion dog could increase prosocial behavior, intimacy, and trust in small work groups. In two different types of groups we found encouraging results. In both problem-solving and decision-making groups (studies 1 and 2, respectively), those with a dog present evidenced more verbal cohesion and physical intimacy. Thus, regardless of the group's task, when a companion dog was present, group members spoke in a more positive and friendly manner to one another (verbal cohesion), and group members were more likely to make eye contact, lean toward one another, and touch

one another (physical intimacy). Two outcomes, however, differed by type of task. In problem-solving groups, which involved a common goal that required considerable interaction, groups with a dog present evidenced more cooperation. Whereas, in decision-making groups, which involved mixed motives and required little interaction, groups with a dog present evidenced greater interpersonal trust.

In study 3, all of the behavioral indicators of positive emotion were higher in the dog-present groups. Most strikingly, a companion dog's effects on positive emotions were still noticeable to observers who were unaware of the presence of the dog and who viewed group interaction for less than a minute.

Admittedly, the mechanisms through which a dog influences interpersonal behavior are complex and multifaceted. Our research, however, provides evidence for at least one mechanism. The results of study 3 indicate that the presence of a companion dog increases positive emotions among group members. We argue that a companion dog's influence on group members' emotional states is likely to stimulate prosocial behavior, intimacy, and trust. However, further research is needed to determine more precisely the dog's influence on these processes.

Limitations and Future Research

A limitation of the current study is that we used only one treatment condition. Having additional experimental conditions would be a good next step, particularly for examining characteristics of the dog that might influence behavior in groups. Also, it is possible that time constraints were a limiting factor. Developing and sustaining high levels of trust and positive emotional regard in groups takes time. Nevertheless, that the presence of a dog produced positive outcomes in experimental sessions lasting less than an hour suggests that the effects are robust.

Additional research is needed on the effects of specific behaviors and features of the dog, particularly in comparison with other animals or non-living objects to examine: (1) what features and behaviors have the largest effects on behavior in groups, (2) what are their main effects, and (3) how might they interact with their bearers. How do movement (movement toward and away from people, general movement) and appearance (cuteness or neoteny) influence behavior in groups? How does a dog compare with active versus non-active or cute versus ugly toys? A recent study by Thodberg et al. (2016), for example, found that when a dog was compared with a toy robot seal (cute and active) and a stuffed cat (cute and inactive), nursing home residents interacted most with the dog and robot seal; over time, however, attention diminished toward the robot seal. Additional research should be conducted with other objects and animals in small group settings.

More research on the dog's effects on human physiology may also help us to understand how the dog influences human emotion. Affectionate touch releases the social bonding hormone oxytocin (Holt-Lunstad, Birmingham, & Light, 2008), and extended petting of a dog can increase oxytocin levels, leading to greater feelings of calmness, trust, and openness to social engagement (Handlin, Nilsson, Ejdebäck, Hydbring-Sandberg, & Uvnäs-Moberg, 2012). Mutual eye gaze also increases oxytocin levels in both humans and dogs (Nagasawa et al., 2015). Several studies have found that the presence of a companion dog reduces levels of the stress hormone cortisol (Barker, Knisely, Barker, Cobb, & Schubert, 2012; Holt-Lunstad et al., 2008). Finally, companion dogs have also been found to lower heart rate and blood pressure, which can increase feelings of wellbeing and calmness (Vormbrock & Grossberg, 1988).

However, this was not supported in our studies. This may be because dogs tend to lower heart rate and blood pressure when an individual is petting his or her own dog for at least 3 minutes (Baun, Bergstrom, Langston, & Thoma, 1984).

Practical Implications

A companion dog may be an effective intervention for increasing prosocial behavior in small groups. Unlike many interventions, which occur only periodically and outside of the normal work environment, the presence of a companion dog can be continuous. In addition, companion dogs at work require minimal effort and maintenance—except for the occasional treat, walk, and bowl of water. Companion dogs in work or educational settings may offer other benefits. For example, taking a dog out for a walk enables people to get some exercise during the day and be exposed to direct sunlight.

Of course there are practical considerations involved with including companion dogs in work or educational settings. For a dog to influence cooperative behavior within groups, it should be visible to and within petting distance of group members as they interact. Some might be concerned that a dog could wander through a workplace and frighten individuals with phobias or cause discomfort to those with allergies. Such potential problems are less likely to occur if dog-friendly policies are developed. For example, organizations might require that dogs be put on probation before becoming an official office companion and that they be kept in owners' offices.

Overall, the findings of these studies provide evidence that companion dogs can improve prosocial behavior in work groups. Additional studies could provide a fuller understanding of the causal mechanisms by which dogs influence prosocial behavior. Practically, our results suggest that organizations may benefit by allowing our furry friends to come to work.

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Conflicts of Interest

The authors state that there are no conflicts of interest.

Notes

1. Most estimates suggest that the dog was first domesticated about 15,000 years ago; other scholars, however, estimate that the dog was domesticated much earlier, as far back as 100,000 years (Vilà et al., 1997).
2. Dogs evolved from wolves (*Canis lupus*), which are cooperative hunters, so it is likely that dogs retained some of the wolf's instinct for cooperative hunting. Dogs prefer cooperative to non-cooperative humans (Freidin, Putrino, D'Orazio, & Bentosela, 2013).
3. Video recordings from seven groups (28 participants) were rendered unusable because of a computer hard drive malfunction, leaving usable video data for 92 participants, 46 in each condition. Physiological and self-report measures were available for all 120 participants.
4. For a more in-depth review of thin-slice methodology, see Ambady and Rosenthal (1993).

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Appendix 1. Behavioral rating scales.

Behavior Category	Definition	Example Behaviors	Rating Samples
Cooperation			
	Any physical or verbal behavior where an individual provides support to other individuals in the group either through physical gestures or by supporting or encouraging statements or ideas.	Offering to do things for the group (e.g., writing for the group). Helping another group member in any way, talking about group success.	1 = Not at all • Does not offer to do anything for the group • Does not help the group out in any way 5 = Very frequently • Very frequently offers to do anything for the group • Very frequently helps the group out in any way
Verbal Cohesion			
	Any verbal interaction between one team member and another related to creating or increasing bonding or closeness.	Giving a compliment. Talking about a topic they agree upon, such as a favorite sports team or favorite professor, etc.	1 = Not at all • Does not give compliments or respond cordially to compliments given • Does not strike up conversation about mutual topics of interest 5 = Very frequently • Very frequently gives or responds to compliments • Very frequently strikes up conversations with other members about mutual topics of interest
Verbal Intimacy			
	Any verbal behavior where an individual makes himself or herself vulnerable to others in a manner that indicates an increase in trust between group members.	Talking about self in self-disclosing manner (*not* in a bragging way but in a self-enhancing way). Talking about one's feelings, sensitivities, weaknesses.	1 = Not at all • Does not talk about self in a self-disclosing manner • Does not talk about feelings, sensitivities, and/or weaknesses 5 = Very frequently • Very frequently talks about self in a self-disclosing manner • Very frequently talks about feelings, sensitivities, and/or weaknesses
Physical Intimacy			
	Physical interactions that reflect an individual group member's attempt to create or increase closeness and bonding between members.	Eye contact Leans/moves body position in a comfortable (relaxed) way toward others when interacting.	1 = Not at all • No eye contact • Does not lean/move body position comfortably toward others when interacting 5 = Very frequently • Very frequently makes eye contact with other group members • Moves/leans body comfortably toward other a great deal during interactions