



The Effect of Walking an Unfamiliar Versus Companion Dog on Mood, Exercise Enjoyment, and Heart Rate: A Pilot Field Study

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ABSTRACT

Topics in Exercise Science and Kinesiology Volume 2: Issue 1, Article 3, 2021. Background: Walking unfamiliar dogs, such as therapy dogs, has been shown to improve physiological exercise responses and exercise adherence, but whether walking a companion dog results in superior benefits is currently unknown. The purpose of the current pilot field study was to elucidate preliminary evidence of how walking an unfamiliar or companion dog influences mood, exercise enjoyment, and heart rate during a 1.5-mile walk. Methods: Participants ($n=8$) walked 1.5-miles at their own pace with an unfamiliar or companion dog while mood, exercise enjoyment, and heart rate were measured. Point of application #1: Walking an unfamiliar dog resulted in improved pre- to post-exercise mood changes compared to walking their own companion dog. Point of application #2: Enjoyment of exercise was higher while walking the unfamiliar dog compared to the companion dog. Point of application #3: Mean exercise heart rate was significantly higher while walking the unfamiliar versus companion dog although time to completion of the 1.5-miles was unaffected.

KEY WORDS: Canine, Profile of Mood States, Pet

INTRODUCTION

The American College of Sports Medicine suggests individuals accumulate 150 minutes/week of moderate intensity physical activity for general health and fitness [1]. However, less than 40% of Americans adhere to these recommendations [2]. While the cause for lack of adherence is multi-faceted, lack of motivation and enjoyment have been cited as playing a pivotal role [1]. Use of dogs to encourage physical activity and promote well-being have been well described [3-6]. Gradjfoner et al. showed that university students interacting with an unfamiliar therapy dog for a single 20-minute intervention significantly decreased anxiety and improved mood [3]. Furthermore, Johnson et al. showed that individuals who underwent a 50-week walking regimen had significantly greater exercise adherence and weight loss while walking an unfamiliar therapy dog versus individuals completing the regimen on their own [4]. Also, dog

owners interacting with their own companion dog have been shown to have favorable health and behavioral outcomes. Temple et al. showed that individuals who own a companion dog are more likely to engage in physical activity versus non-dog owners even through inclement weather [5]. Interaction with companion dogs has also been reported to be anxiolytic and produce favorable cardiovascular responses during stress [6]. Collectively, previous evidence has suggested positive health effects for interaction with both unfamiliar and companion dogs. However, it is currently unknown if interacting with an unfamiliar or an individual's companion dog results in superior benefits, especially in real-world environments. The purpose of the current pilot field study was to elucidate preliminary evidence of how walking an unfamiliar or companion dog influences mood, exercise enjoyment, and heart rate during a 1.5-mile walk.

METHODS AND RESULTS

Using a crossover counterbalanced study design, physically active males and females (males, $n=2$; females, $n=6$; age= 30.9 yrs \pm 8.0, height= 171.13 cm \pm 13.30 , body mass= 69.52 kg \pm 16.81) completed two separate dog-walking trials: 1) With an unfamiliar dog (UD), 2) With their own companion dog (CD). During each trial, participants completed a 1.5-mile self-paced walk with either the UD or CD. For the UD condition, a single dog (golden retriever) which participants had never interacted with was used for all trials. For the CD condition, participants walked their own dog which they were required to have owned for at least one year. The unfamiliar and companion dogs all fell into the medium-to-large size category according body mass (40-65 lbs) [7]. The following breeds were used for the CD condition: Labrador Mix, Standard Poodle, Aussie Doodle, Golden Retriever, Pitbull Mix, German Shepherd, Terrier Mix, and Unknown Mix breed. Prior to walking, participants were outfitted with a heart rate monitor (Polar H10, Polar Electro, USA) and completed an abbreviated Profile of Mood States (POMS) questionnaire to assess mood (see equipment used) [8]. Dogs were allowed to void prior to commencement of walking to prevent stoppage during the exercise. All dogs were reported to be walked regularly (≥ 1 day/week). Visits were conducted outdoors in the early autumn season during temperate days and average temperatures were not significantly different between visits (data not shown). Participants were instructed to walk at their own pace while maintaining the dog at their side not allowing the dog to pause. Heart rate was monitored throughout the entirety of the walk and averaged for analysis. Following completion of the walk, participants reported subjective exercise enjoyment using a 100 mm line visual analog scale (see equipment used) [9,10]. Participants then completed the POMS an additional time. Visits were separated by at least 24 hours. All data were analyzed using Jamovi software (Version 0.9). A paired samples *t*-test was used to detect statistical differences for all data. Cohen's *d* effect sizes (*d*) were used to estimate magnitudes of change and were interpreted with the following cutoff points: <0.2- trivial, 0.2 – small; 0.5 – moderate; 0.8 – large [11]. All data are presented as mean \pm standard deviation (SD). Significance was set a $p \leq 0.05$ *a priori*. Since this was a pilot study, adequate sample sizes for future investigations were calculated using G*Power 3.1.9.6. Since effect sizes for changes in mood and exercise enjoyment were >0.8 , the following parameters were used: test= *t*-test (matched pairs), $d = 0.80$, $\alpha = 0.05$, $\beta = 0.8$. This yielded a minimum sample size of $n = 15$.

PRACTICAL APPLICATIONS

Practical Application 1: *Walking an unfamiliar dog resulted in improved pre- to post- exercise mood changes compared to walking their own companion dog.*

Total POMS scores were taken pre- and post- exercise. To calculate the changes in mood (Δ POMS), post- scores were subtracted from pre- (note: a larger negative number indicates greater improvements in mood which is considered desirable). Findings showed that POMS scores decreased to a greater extent, indicating better improvements in mood, from pre- to post- during the UD condition versus CD (UD= -4.9 ± 2.8 , CD= -1.0 ± 1.7 ; $p= 0.031$; $d= 1.73$). Given that the effect size was interpreted as large, walking a UD appears to have a robust effect of improving mood compared to walking a CD. Previous evidence has shown that unfamiliar situations have the ability to induce enthusiasm and happiness if presented in a positive validating way [12]. Since the UD was presented by researchers as “nice” and “likeable”, this may have been perceived a positive validating experience by participants which may have improved happiness and mood. More research is needed to determine if subjective perceptions of the dog itself influence mood.

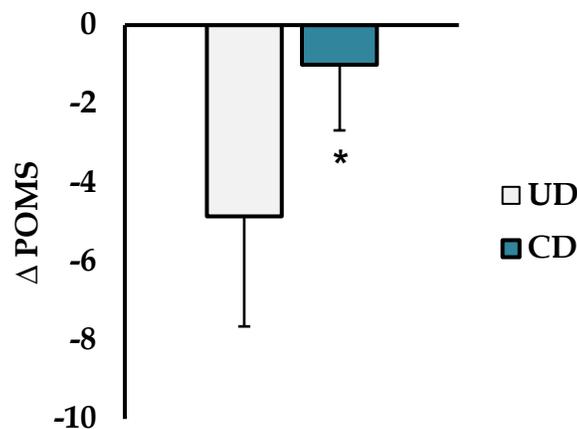


Figure 1. Pre-post changes in Profile of Mood States (Δ POMS) questionnaire scores between the unfamiliar dog (UD) and companion dog (CD) conditions. Data are presented as mean \pm SD. * indicates significantly different from UD ($p < 0.05$). Note: a larger negative number indicates greater improvements in mood, which is considered desirable.

Practical Application 2: *Enjoyment of exercise was higher while walking the unfamiliar dog than while walking the companion dog.*

At the conclusion of exercise, participants rated how much they enjoyed the exercise bout using a visual analog scale ranging from 0 (no enjoyment) to 100 (extremely enjoyable). Subjective ratings of exercise enjoyment were significantly higher during the UD condition versus CD (UD= $78.1 \text{ mm} \pm 5.6$, CD= $70.0 \text{ mm} \pm 8.9$; $p=0.035$; $d= 0.86$). Notably, the effect size was interpreted as large. Practically speaking, these findings may have important implications for exercise adherence as increased exercise enjoyment is linked to better compliance to exercise

training [13]. However, it is unknown whether walking with a UD chronically increases enjoyment and exercise adherence necessitating further exploration.

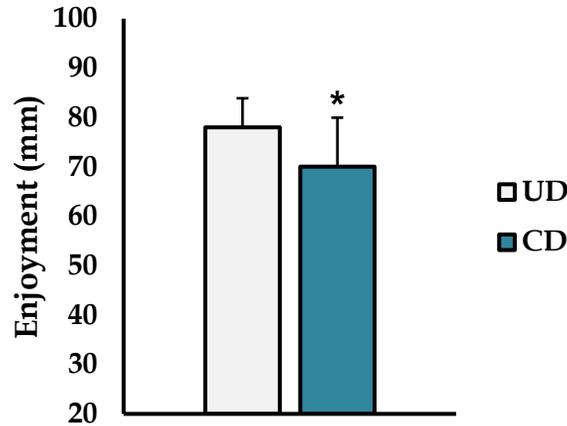


Figure 2. Comparison of the subjective enjoyment of exercise (mm) between unfamiliar dog (UD) and companion dog (CD) conditions. Data are presented as mean \pm SD. * indicates significantly different from UD ($p < 0.05$).

Practical Application 3: *Mean exercise heart rate was significantly higher while walking the unfamiliar versus companion dog, although time to completion of the 1.5-miles was unaffected.*

Heart rate was monitored throughout the entirety of the exercise bout and averaged for analysis while time to completion denoted the total time it took for participants to walk the 1.5-mile distance. Mean heart rate during the UD condition was significantly higher than the CD condition (UD= 137.0 ± 20.1 , CD= 129.0 ± 22.0 ; $p = 0.046$; $d = 0.28$). However, the magnitude of change was small. Time to completion was not statistically different between conditions (UD= $26.5 \text{ min} \pm 1.5$, CD= $27.7 \text{ min} \pm 2.5$; $p = 0.302$; $d = 0.55$) though the effect size was interpreted as moderate. Previous evidence has shown the interacting with a companion dog results in reduced sympathetic nervous system output which may explain the current lower heart rates during the CD condition [6]. However, it is unclear whether the small effects of change in heart rate have any practical importance. Lack of differences in time to completion may be due to the propensity of dogs to synchronize their movement to humans [14]. This would suggest that the participants may have maintained their own comfortable pace to which the dog adapted to thus eliminating differential influences of each type of dog on walking speed. However, this is speculative as pacing for the participants or dogs was not measured.

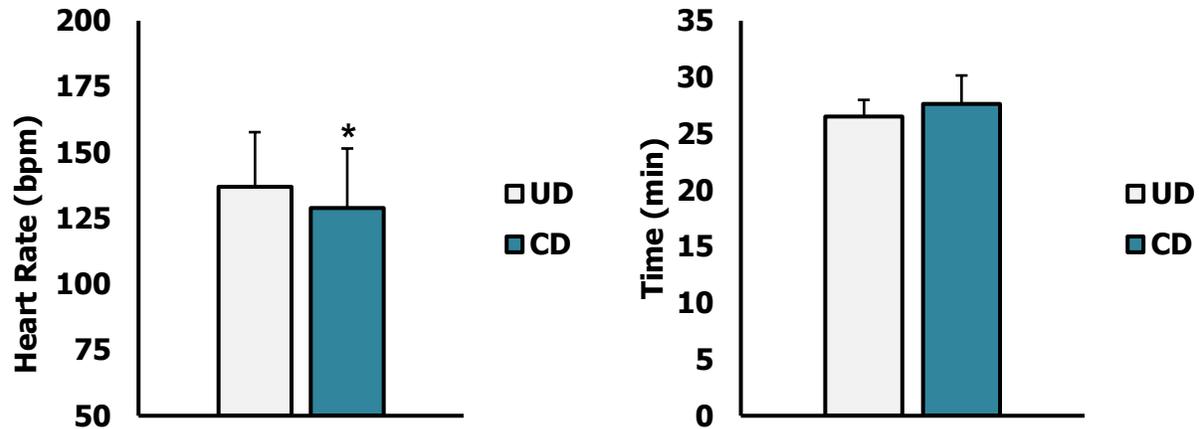


Figure 3. Comparison of mean heart rate (beats per minute; bpm; ; left) and time to completion of the 1.5-miles (mins; right) between unfamiliar dog (UD) and companion dog (CD) conditions. Data are presented as mean \pm SD. * indicates significantly different from UD ($p < 0.05$).

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EQUIPMENT UTILIZED



Polar H10 Heart Rate Monitor Chest Strap (Polar Electro, USA)

Enjoyment VAS

Please indicate on the line what most accurately describes your thoughts and feelings of how enjoyable your exercise experience was:



Exercise Enjoyment Visual Analog Scale (VAS)

Abbreviated POMS (Revised Version)

Name: _____ Date: _____

Below is a list of words that describe feelings people have. Please **CIRCLE THE NUMBER THAT BEST DESCRIBES HOW YOU FEEL RIGHT NOW**.

	Not At All	A Little	Moderately	Quite a lot	Extremely
Tense	0	1	2	3	4
Angry	0	1	2	3	4
Worn Out	0	1	2	3	4
Unhappy	0	1	2	3	4
Proud	0	1	2	3	4
Lively	0	1	2	3	4
Confused	0	1	2	3	4
Sad	0	1	2	3	4
Active	0	1	2	3	4
On-edge	0	1	2	3	4
Grouchy	0	1	2	3	4
Ashamed	0	1	2	3	4
Energetic	0	1	2	3	4
Hopeless	0	1	2	3	4
Uneasy	0	1	2	3	4
Restless	0	1	2	3	4
Unable to concentrate	0	1	2	3	4
Fatigued	0	1	2	3	4
Competent	0	1	2	3	4
Annoyed	0	1	2	3	4
Discouraged	0	1	2	3	4
Resentful	0	1	2	3	4
Nervous	0	1	2	3	4
Miserable	0	1	2	3	4

Abbreviated Profile of Mood States (POMS) Questionnaire

