Emotional Reciprocity in the Human–Canine Bond: Just Behaving's Mentorship Model in Theory and Practice

Background: Attachment, Mentorship, and Emotional Reciprocity

The human-dog bond is characterized by a deep emotional connection that often mirrors a parent-child attachment. Dogs form attachment relationships with their owners, using them as a secure base much like human infants do with caregivers <u>pmc.ncbi.nlm.nih.gov</u>. In practical terms, this means a dog explores the world more confidently in the presence of a trusted owner and seeks them for safety and guidance during stress <u>pmc.ncbi.nlm.nih.gov</u>. Emotional reciprocity in this context refers to the two-way exchange of emotional states between human and canine – each partner's feelings and behaviors influence the other in a continuous feedback loop. A calm, reassuring human can impart a sense of security to the dog, while an anxious or agitated owner may inadvertently transmit tension. This bidirectional emotional mirroring is viewed as the *essence of the relationship* in many expert perspectives <u>nationalgeographic.com</u>, forming the foundation of a harmonious human–canine bond.

Just Behaving's mentorship model builds upon attachment theory by positioning the human as a parental mentor rather than a mere trainer. In the Just Behaving philosophy, the owner or handler provides consistent calm leadership and guidance from day one. analogous to a parent guiding a child justbehaving.com. Obedience is not enforced through dominance or bribed with treats, but arises naturally as the dog "tunes in" to the mentor's cues and expectations justbehaving.com. This approach emphasizes structured companionship and intrinsic learning: puppies are raised alongside *calm* adult dog mentors and human guides, which fosters natural learning and emotional intelligence from the start justbehaving.com. By preventing chaotic or fearful experiences and modeling appropriate behavior, the mentor teaches the puppy how to respond to the world in a balanced way. Over time, the dog internalizes calmness as its *default emotional state* and develops into a stable, trusting companion. The reciprocity in this mentorship dynamic is crucial – the human's emotional regulation and guidance are mirrored by the dog's behavior, and the dog's responses in turn inform the human to adjust their approach. The outcome, as described in Just Behaving's foundational documents, is a "calm, balanced, and emotionally resilient" dog raised through thoughtful leadership and consistent mentorship justbehaving.com rather than through corrective training alone.

Theory: Emotional Contagion and Mirroring Between Species

Modern behavioral science supports the idea that dogs closely model human emotional states through a phenomenon known as *emotional contagion*. Emotional contagion is a basic form of empathy defined as a matching of emotional state between individuals

pmc.ncbi.nlm.nih.gov. In multi-species social groups like a human and dog, this means that a dog can "catch" the emotions of its owner. Dogs are highly attuned to human body language and tone of voice, and they often adjust their own behavior in response to subtle cues. Studies have shown that dogs interpret human facial expressions and postures in ways very similar to human-to-human social processing <u>earth.com</u>. For example, an owner's upright, relaxed posture and soft gaze signal to the dog that all is well, whereas a tense stance or furrowed brow might raise the dog's concern. Likewise, the tone of voice we use – calm and gentle vs. angry or frantic – strongly affects canine behavior. Research demonstrates that when owners project feelings of calm confidence, dogs tend to view their surroundings as safe and act more relaxed <u>nationalgeographic.com</u>. In contrast, an owner's stress or anxiety can swiftly transfer to the dog, elevating the dog's own stress level <u>nationalgeographic.com</u>. In essence, dogs look to their humans much like young children look to parents: as emotional barometers for how to react to the world <u>nationalgeographic.com</u>.

This mirroring extends beyond behavior into physiology. Scientists have found evidence of interspecies synchronization of stress and arousal responses. For example, recent studies show that long-term cortisol (stress hormone) levels in dogs track those of their owners, demonstrating a remarkable synchronization over time sci.news dvm360.com. In a 2019 study, hair cortisol concentrations of dogs were highly correlated with their owners' levels across seasons, indicating that a person with chronic stress is likely to have a dog with signs of chronic stress as well dvm360.com. This is not merely oneway; it suggests a continuous loop of influence. On shorter timescales, during momentto-moment interactions, dogs and owners can even show synchronized patterns in heart rate and its variability, a measure of autonomic nervous system balance. A recent experiment demonstrated that a dog's heart rate variability adapts to its owner's during calm interactions, implying that they share synchronized emotional arousal states psypost.org. Such co-regulation means that when an owner practices soothing techniques (like slow breathing or gentle petting), the dog's physiology can literally "entrain" to that calmer state. Biochemical bonding mechanisms are also at play: mutual gazing between a dog and their human triggers oxytocin release in both, strengthening the social bond and increasing attentiveness to each other's emotional signals nationalgeographic.com nationalgeographic.com. This hormonal feedback loop further facilitates emotional attunement. Taken together, the literature paints a clear picture that human and dog emotions are deeply interlinked on behavioral, physiological, and neuroendocrine levels. The dog is continuously reading the mentor's emotional cues (posture, tone, scent, tension) and often mirrors them — a core principle that Just Behaving's mentorship methodology recognizes and leverages.

Proposed Study Design: Owner Emotional Regulation Training and Canine Outcomes

To investigate the impact of structured owner emotional regulation on dogs, we propose a comparative experimental study grounded in the mentorship-based approach. The central hypothesis is that improving an owner's ability to remain calm and emotionally regulated will positively affect their dog's behavior and stress recovery. The study will employ a mixed-group design with a diverse participant pool, including both first-time dog owners and experienced dog handlers, as well as both puppies and adult dogs in each owner category. This 2x2 factorial design (owner experience × dog developmental stage) allows analysis of whether owner expertise or the dog's age modulate the effectiveness of the intervention.

Participants and Group Allocation

We will recruit, for example, N = 40 owner-dog pairs, divided evenly into four subgroups: (1) first-time owners with puppies (dogs <1 year), (2) first-time owners with adult dogs (>2 years), (3) experienced owners/handlers with puppies, and (4) experienced owners with adult dogs. Within each subgroup, participants will be randomly assigned to either an intervention group or a control group. The intervention group owners will undergo a structured emotional-regulation training program (described below), while control group owners will not receive this training during the initial phase. This controlled design will enable comparisons between trained vs. untrained owners, as well as comparisons across experience levels and dog ages. All dogs will be healthy and without severe behavioral pathologies that could confound the results (screened via a pre-study veterinary and behavioral assessment). Owners in the "experienced" category may be defined as those who have had multiple dogs or formal training experience (such as dog sport or prior behavior modification experience), whereas "first-time" owners have no substantial prior dog-raising experience. By capturing this variety, the study can determine if novices benefit more from training than seasoned handlers, and if puppies (who are developmentally primed to absorb new cues) respond differently than adult dogs to changes in owner behavior.

Owner Emotional Regulation Training Intervention

Owners assigned to the intervention will participate in a structured training program focusing on awareness and modulation of their own emotional and physiological states during interactions with their dogs. The training, lasting ~4–6 weeks, will be based on Just Behaving's mentorship principles – essentially teaching owners to "just behave" in the calm, guiding manner that they want their dog to emulate. Key components of the program include:

• **Breathwork Exercises:** Owners practice slow, deep breathing techniques to lower their heart rate and remain centered. Sessions will teach diaphragmatic breathing and give owners strategies to use this during dog-related events (e.g. before a walk, or when the dog is excited or anxious) to consciously project

calmness. Regulated breathing not only changes the owner's physiology but can also signal the dog through subtle changes in the owner's body tension and even pheromonal cues of stress reduction.

- Calm Body Language and Posture: The training emphasizes maintaining a relaxed, open body posture and smooth movements around the dog. Owners will learn to become mindful of involuntary signals for instance, stiffening up on the leash when worried, looming over a dog, or gesturing frantically and instead practice non-threatening, confident postures. By modeling relaxed body language, the owner provides the dog with a visual cue of emotional calm. (This aligns with research suggesting dogs process human body language similarly to humans <u>earth.com</u> and will respond with trust when the human's movements are composed, not erratic or fearful.)
- Tone Modulation and Vocal Cues: Owners will be coached on using a low, steady tone of voice and consistent, gentle verbal cues. They practice giving commands or reassurance in a calm, encouraging manner even if the dog is misbehaving or something startling occurs. Excited high-pitched squealing or harsh scolding are discouraged, as those can either amp up the dog or induce anxiety. Instead, a mentor-like tone is cultivated – firm but affectionate, signaling confidence. Dogs are highly sensitive to the emotional *tone* of human voices <u>nationalgeographic.com</u>, so modulating one's voice becomes a tool for emotional contagion of calmness.
- Mindful Daily Routines: The program incorporates mindfulness into daily owner-dog routines. Owners are encouraged to establish predictability and gentle structure in the day (for example, a calm greeting ritual in the morning, quiet time after meals, and low-key training/play sessions). They will also practice their regulation techniques in real-life contexts: e.g., doing a brief breathing exercise before heading out for a walk (especially if the dog tends to get overexcited or pull), or consciously relaxing their muscles when the dog encounters a trigger (such as a loud noise or a strange dog). By making calm mentorship a habit, the owner's regulated behavior becomes a constant model for the dog. Over time, the dog should generalize this atmosphere of emotional stability to new situations.

The training will likely be delivered through a combination of workshops (or virtual sessions) and written guides/exercises (potentially drawing from materials like *Just Behaving's Puppy Development Journal* to integrate daily practice – see below). Owners in the intervention arm will log their practice of these skills to ensure compliance. The control group owners will continue with their usual handling of the dog during the study period (and may be offered the training after the study for ethical

balance). It is expected, based on the Just Behaving philosophy, that the owners who learn to "mentor" their dogs emotionally will see improvements in their dogs' calmness and responsiveness.

Outcome Measures and Data Collection

We will evaluate a range of **physiological and behavioral outcomes** in dogs to quantify the effect of owner emotional-regulation training. Both objective biomarkers and observable behaviors will be measured, to capture the full picture of the dog's emotional and behavioral state. Key **outcome metrics** include:

- Physiological Indicators: Measures of stress reactivity and recovery in the dog. The primary biomarker will be salivary cortisol levels, obtained non-invasively by swabs at specific times (e.g., morning baseline and after a mild stress challenge). Cortisol is a well-established index of acute stress; lower post-intervention cortisol or a blunted rise during stress would suggest improved stress regulation. We will also use heart rate variability (HRV) as an indicator of autonomic nervous system balance. Dogs will wear canine heart rate monitors during certain activities; an increase in HRV (i.e., more variability between heartbeats at rest) generally corresponds to a more relaxed, parasympathetic-dominated state. Joint analysis of cortisol and HRV can show if the dog's physiological stress responses are dampened after the owner undergoes training. Notably, prior work has found that dogs and owners can exhibit linked patterns in these measures <u>psypost.org</u> – we will explore whether improving the owner's metrics (through their own stress reduction) correlates with improvements in the dog's metrics over time, strengthening the evidence of co-regulation.
- **Behavioral Observations:** A variety of behaviors will be tracked to assess the dog's emotional state and obedience in everyday and test situations. These include:
- Frequency of stress signals or anxious behaviors: e.g. pacing, panting when not hot, whining, excessive yawning, lip-licking, and "shaking off." A lower frequency of these behaviors in routine settings would indicate a more relaxed dog. We will specifically monitor how often and how intensely dogs exhibit such signals during mildly challenging scenarios (for instance, the approach of a stranger or an unfamiliar noisy object) and during routine handling (grooming, walking in busy areas, etc.).
- Responsiveness to cues and training commands: Dogs' compliance with known commands (sit, down, recall, etc.) and their attention to the owner under distraction will be measured. A well-regulated dog should remain attentive and able to follow cues from a calmly assertive owner, even if there are external

stimuli. We expect that dogs whose owners have better emotional control may show improved responsiveness, as the owners' cues will be clearer and less conflicting (e.g., an owner who is not yelling or panicking can give more precise instructions).

- Leash behavior and calmness in motion: This includes tracking instances of leash-pulling, lunging, or other over-arousal during walks. We will use a standardized walking test (walking past various mild distractions) and score the dog's leash manners. Better owner regulation (for example, the owner staying relaxed and not inadvertently tightening the leash or transmitting anxiety down the leash) is hypothesized to result in more calm walking (loose leash, fewer sudden pulls).
- Arousal modulation and settle ability: How quickly can the dog settle down from a state of excitement? We will observe the dogs during play and after play, noting how readily they can shift from high arousal to a relaxed state. Similarly, if the doorbell rings (a common trigger for excitement or barking), how easily can the dog be calmed by the owner? We expect the intervention dogs to have improved arousal modulation, meaning they do not remain "amped up" as long and can relax more swiftly on the owner's cue or presence.
- Recovery time after a startle or stressful event: In a controlled test, each dog will be exposed to a mild startle (for example, a sudden harmless noise or an opening umbrella at a distance) while the owner is present. We will measure the dog's recovery time how many seconds or minutes it takes to return to baseline behavior (cessation of startle reactions like freezing or barking, and return to normal exploratory or resting behavior). We anticipate that dogs with emotionally regulated owners (who themselves react minimally and then offer reassurance) will recover more quickly from surprises, whereas dogs whose owners react with alarm or tension may take longer to settle <u>nationalgeographic.com</u>. Shorter recovery times in the intervention group would indicate better resilience and co-regulation.

To gather these data, we will utilize both laboratory-style assessments and in-home monitoring. In a lab or training center setting, standardized behavioral tests (such as the startle test, leash walking course, and command responsiveness trials) will be conducted pre- and post-intervention, with video recordings scored by blinded observers. Cortisol samples will be collected at baseline and after a mild stressor (e.g., a 10-minute separation from the owner, or a novel object test) in both pre- and post-training phases. HRV will be monitored via a wearable sensor (e.g., a specialized collar or harness) during a set of activities (like a 5-minute rest period and a short play session) before and after the intervention period.

In addition, we will incorporate daily journaling/logging methods for owners to record observations in the home environment. Each participant will be given a structured diary, similar to the Just Behaving Puppy Development Journal or Longitudinal Tracker, to log day-to-day interactions and progress. Owners will record events such as: times they practiced the breathing or posture techniques, notable changes in their dog's behavior (calm or anxious episodes), any triggers encountered (e.g., visitors, loud noises) and how both they and the dog responded. They will also note the dog's resting demeanor each day (perhaps rating the dog's overall calmness or stress on a simple scale) and compliance with routine cues. This qualitative data is crucial for capturing subtle improvements that standardized tests might miss. It allows us to see trends over the course of the intervention – for example, a first-time owner might note that her puppy went from hyperactive during evening TV time to calmly lying at her feet after she consistently applied the training techniques for a couple of weeks. The journals also encourage owner self-reflection on how *their* mood and actions affect the dog, reinforcing the mentorship mindset. For research purposes, these logs can be analyzed for frequency of noted stress behaviors per week, adherence to exercises, and any qualitative descriptions of the human-canine interaction. We will complement owner logs with occasional home video recordings (submitted by owners or taken by researchers, if feasible) to validate and enrich the self-reported data.

Finally, to assess retention and longer-term effects, the study can include a follow-up evaluation (say, one month after the formal post-test). This would examine if owners continue using the techniques and if dogs maintain the gains or improve further, indicating a lasting change in the dyad's emotional dynamic rather than a short-term training effect.

Implementation Strategies for Research and Practice

Clinical Trial and Research Implementation: From a research standpoint, this study could be implemented as a collaboration between a veterinary behavior program and a human psychology or physiology department. A controlled clinical trial might be conducted at a veterinary university or animal behavior research center where facilities for collecting saliva, conducting behavioral tests, and possibly measuring heart rate are available. DACVB residents (veterinary behaviorists in training) could be directly involved in running the behavioral assessments and owner training sessions, ensuring that the procedures are clinically sound and humane. The owner training intervention materials could be developed with input from both animal behavior experts and human clinical psychologists (for the stress-reduction techniques), embodying the cross-disciplinary nature of the project. If a full lab setup is not available for all measures, certain parts of the study can be done in a field setting: for example, providing owners with saliva collection kits and heart-rate monitors to use at home with clear instructions (and having veterinarians or technicians collect samples periodically). Regular virtual

check-ins or home visits (if local) can ensure protocols are followed. Employing technology, such as smartphone apps for diary entries or even wearable devices that sync data to researchers, can facilitate data collection in real-time and increase accuracy.

In-Home Studies: Not all owners can easily come to a lab, so an in-home study model is a valuable complement. In-home research can increase ecological validity by observing the dog in its natural environment. For implementation, researchers can ship an "assessment package" to participants – including a heart rate sensor for the dog, a tripod and camera for recording certain tasks, and sample collection materials – along with detailed instructions. Virtual training for owners (webinars or videos teaching the emotional regulation techniques) can be provided to those in the intervention group, perhaps accompanied by printed manuals and exercises (drawing on the Just Behaving guides). Owners could then conduct prescribed activities (like a set training routine or a mild startle test) on their own and record the dog's behavior for researchers to analyze. While this relies on owner compliance and accurate reporting, the use of objective measures like cortisol and HRV, and the inclusion of a control group, help maintain scientific rigor. Furthermore, an in-home approach broadens the participant pool geographically and makes findings more generalizable to real-world pet ownership scenarios.

Applications in Training Programs: The insights from this study have direct translational potential for dog training and behavior modification programs. If the hypothesis is confirmed, it would reinforce that training the owner's emotional skills is as important as training the dog. Professional dog trainers and behaviorists could incorporate an "owner emotional-regulation module" into puppy classes, obedience courses, and private consultations. For instance, puppy socialization classes might start with a brief mindfulness exercise for owners, or trainers might coach owners through breathing techniques when their dog gets distracted or nervous. The concept of *mentorship-based training* could be formally introduced, educating owners that their dog is constantly learning from their demeanor. Training curricula could include role-playing scenarios where owners practice remaining calm and using a soothing voice in situations that commonly frustrate people (like when a puppy is nipping or a dog is barking at the door). By embedding these practices, we shift some focus away from just "how to correct the dog" to "how to present yourself" – effectively enriching standard training with the emotional reciprocity component.

Veterinary Behavior Practice: Veterinary behaviorists and clinicians dealing with anxiety or aggression cases in dogs may find this approach particularly useful. Often, these professionals observe that an owner's inadvertent reactions can maintain or exacerbate a dog's problem behavior (for example, a nervous owner of a leash-reactive dog might tighten up and convey anxiety as another dog approaches, cueing their dog to also react fearfully or aggressively). With evidence-based support, veterinarians can confidently prescribe owner-focused interventions as part of the treatment plan. For a dog with separation anxiety, for instance, the vet behaviorist might spend time teaching the owner relaxation techniques and calm departure routines, not just focusing on the dog's training. The outcome measures from our study (like cortisol or HRV) could even become tools in practice: a veterinarian might track a dog's cortisol over the course of therapy as an objective measure of improvement, paralleling owner self-improvement. Moreover, understanding the science of emotional contagion can motivate owners to manage their own stress for their pet's benefit – a powerful re-framing that could improve compliance with behavior modification plans.

Collaboration and Future Directions: This proposed study exemplifies a collaborative effort bridging human psychology, animal behavior, and veterinary science. It opens avenues for interdisciplinary research: animal behavior researchers could partner with physiologists to further explore mechanisms of dog-human co-regulation (perhaps examining brainwave synchronization or detailed hormone profiles); meanwhile, psychologists interested in stress reduction might find a unique model in working with dog owners as a population who are motivated to learn stress management for the sake of their pets. The study could also inspire longitudinal research (following puppies and owners over years to see how early mentorship impacts lifelong outcomes) and comparative studies with other species (e.g., do similar patterns hold for cats and their owners, or horses and riders, etc.?). For the veterinary behavior community, such research provides quantitative backing for what many clinicians anecdotally suspect – that treating the *dyad* (owner and animal together) is more effective than treating the dog alone.

In summary, emotional reciprocity in the human-canine bond is both a scientific reality and a practical training consideration. By grounding our approach in the *Just Behaving* mentorship philosophy and attachment theory, we acknowledge that a dog's emotional life is profoundly intertwined with that of its human. This report has outlined how dogs mirror human emotions and why fostering positive emotional models is critical. The proposed comparative study offers a method to formally evaluate the benefits of ownerfocused emotional regulation training on canine behavior and stress, using robust measures from cortisol levels to leash manners. Implementing such research in clinical and home settings will require coordination across disciplines but promises rich rewards: improved well-being for dogs and owners alike, and a blueprint for future training paradigms. Embracing the role of *emotional mentors*, owners can raise calmer, more resilient dogs – and in doing so, strengthen the reciprocal bond that is at the heart of our relationship with "man's best friend." Each calm breath an owner takes and each gentle cue they give can ripple through the leash, guiding their dog toward a state of balance. Ultimately, this line of inquiry and practice has the potential to enrich our understanding of the human-animal connection and to inform more humane, holistic approaches to companion animal care grounded in empathy, science, and mutual respect.

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