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IN BRIEF: PRACTICE AND PROCESS

Understanding the genetic basis of canine anxiety: phenotyping dogs for behavioral, neurochemical, and genetic assessment

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Introduction: the Canine Behavioral Genetics Project (CBGP)

Behavioral problems account for the death, relinquishment, or the end of breeding careers of more dogs than does any other set of problems (Miller et al., 1996; Patronek et al., 1996; Salman et al., 1998, 2000; Scarlett et al., 1999; Shore et al, 2003; Mondelli et al., 2004; Shore, 2005). Whereas many behavioral complaints involve management-related issues or dog-human temperament mismatches, the behavioral concerns that are most interesting to scientists and breeders alike are those with familial patterns.

A number of conditions have been identified as running in family lines of a number of breeds including, but not restricted to, generalized anxiety/fear, noise phobia, impulse/control aggression, conspecific aggression, predatory aggression, and obsessive-compulsive disorder (Overall, 1994; Overall and Dunham, 2002; Overall, 2005). Most of these conditions appear sometime between one and two years of age, the social maturity period, during which neural systems are undergoing extensive developmental changes. The potential benefit of genetic counseling is clear, and the potential to make dogs "safer" and happier is substantial. Understanding the genetic bases of behavioral problems will lead to more humane treatment of dogs, fewer public health risks, an improved public perception of dogs as pets, and a considerable lessening in the recycled pet problem. Additionally, elucidation of the biological systems underlying pathological behavior will heighten our general understanding of the underlying molecular biology of behavior, allowing the dog to contribute to this rapidly evolving field.

Over 50 breeds across all seven AKC groups have family lines in which "fear/shyness/nervousness/panic/anxiety" is a major breeder-reported concern (Overall, unpublished). Within these breeds, this "trait" often follows familial lines, suggesting a heritable basis. This pattern has been noted for many physical conditions in dogs (Sutter et al., 2004; Lark et al., 2006), but little emphasis has been placed on behavioral conditions because of the difficulty in defining a clear phenotype. Although recognition of other genetically mediated conditions is often straightforward, based on easily observable clinical phenomena that are defined by consensus (e.g., cancer, retinopathies, narcolepsy), assignment of behavioral phenotypes can be open to misclassification or misinterpretation (Overall, 2005; Overall and Burghardt, 2006).

The broad goal of the CBGP is to explore the genetic background of anxiety-related behavioral problems in dogs. To do so, we must: (1) solicit the participation of owners of candidate dogs possibly affected by anxiety-related behavioral problems; (2) identify affected and unaffected dogs,

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using the necessary and specific diagnostic criteria to make a diagnosis of the condition; (3) confirm the presence of the relevant diagnosis in these dogs and if possible in their family lines, using reliable, repeatable, and validated behavioral measures involving questionnaires and videos; and (4) obtain DNA samples for genetic linkage and association analyses, along with the relevant pedigrees. In this article, we discuss the distinction between diagnosis and phenotype, and we describe our protocol for assessing behavioral phenotypes in dogs, addressing the second and third aspects of our project just discussed.

Diagnosis vs. phenotype

The questions we are most commonly asked are: (1) "What behaviors are you interested in?" and (2) "How do you phenotype canine behavior?" Both of these questions are important and more complex than they appear, and each is related to the other and to the methodology used in the study.

In biomedically oriented genetic investigations, phenotypes are often defined by the diagnoses under study. Thus, phenotypes such as hip dysplasia, diabetes, hypothyroidism, or noise phobia are defined by consensus clinical criteria. The use of such consensus criteria means that not every subject who has received a diagnosis of the condition is necessarily considered a candidate for genetic investigation; only those meeting the consensus criteria—often more restrictive than broad, clinical, diagnostic criteria—are considered on the basis of phenotype for further genotypic examination. If the diagnostic criteria are sufficiently clear and well defined, those meeting them should at least share overlapping or clusters of phenotypes, even if one, overriding phenotype does not emerge. For example, in human panic disorder, patients experience panic attacks, which are discrete episodes of extreme fear accompanied by a set of physiological and psychological symptoms. One person experiencing palpitations, chest pain, sweating, and a choking sensation may not share these same symptoms with another person whose panic attack is characterized by tremor, dizziness, chills, and nausea, yet both have panic disorder based on longitudinal research.

It is also possible to extend these definitions beyond the discrete disease diagnoses to produce a broader phenotype, either as a spectrum of pathology or to include other phenomena that overlap with the target phenotype. For example, it has been proposed that particular behaviors that occur across the population, but appear to be enriched in human patients with a behavioral disorder, may provide a more focused biological pathway for the study of that disorder. These so-called "endophenotypes" (Gottesman and Gould, 2003) have led to interesting hypotheses about the pathophysiology and genetics of disorders such as schizophrenia and mood disorders (Hariri et al., 2005; Pezawas et al., 2005; Tunbridge et al., 2006). This approach also allows clusters of behavioral responses to be compared with clusters of neurochemical or physiological responses that occur with the discrete groups examined (Overall, 2005).

The use of additional, seemingly "unrelated" clinical information allows the investigator to extend his or her definition of phenotype far beyond the particular disorder under study. For example, in one study of human panic disorder, a constellation of medical symptoms, including renal and bladder conditions, thyroid disorders, headaches, and mitral valve prolapse, helped to genetically define a subset of persons with panic disorder (Weissman et al., 2000; Hamilton et al., 2003). Indeed, when subjects with a common bladder condition called interstitial cystitis were examined, panic disorder was highly enriched in the subjects and their families when compared to controls (Weissman et al., 2004). These types of approaches allow us to ask questions about underlying genetic and neurochemical associations for conditions that may not appear to be related at first glance.

In previous work, we distinguished between noise phobia and separation anxiety in dogs in a clinical population, although there exists an overlap between these disorders (Overall et al., 2001). Whether this overlap is caused by an overlap in definitions of the disorder, comorbidity between common disorders, or pleiotropic expression of a broader behavioral phenotype is currently unknown, but this is exactly the sort of question our study tools are intended to address. The starting point of our study lies in its definition and assessment of phenotype using objective criteria based on observable phenomena. This approach is to be distinguished from attempts to attribute motivations to a behavior or define a behavior purely on its context.

Methods and tools of assessment

Participating dogs and owners in the CBGP are recruited from active owners, trainers, breeders, handlers, and the general pet-owning public. We are particularly interested in anxiety-related disorders, including many aggressions, and in families or households of dogs in which some dogs are affected, and some dogs are not affected. By using unaffected and affected dogs we can conduct a case-control analysis, which speeds the rate at which suspect genetic contributions can be readily identified. These types of studies are traditionally performed in laboratory environments, where context and breeding can be tightly controlled. For general questions about patterns of expressed phenotype and potential heritability, laboratory studies are almost always too tightly constrained. Laboratory studies are at their best for the examination of a single complex condition which can be elucidated by crossing at least two different breeds that are affected, and for in-depth studies of the

neurochemical and molecular pathology and interventions that can manipulate it (see Parker and Ostrander, 2005 for examples). By moving our studies from the laboratory (after Scott and Fuller, 1965) to the home, we have sacrificed a controlled environment for a more naturalistic one, but with the benefit that it is in the latter in which dogs are expected to live. Using dogs in the home environment also has the advantage of allowing a full evaluation of a range of phenotypes that would likely not be expressed in controlled circumstances. It is also true that by considering the environment in which the dog is living, useful intervention may be suggested.

All participating owners are required to: (1) complete an extensive assessment questionnaire (24 pages; see Appendix) for each dog, (2) submit all biological samples requested (buccal swabs and/or blood for DNA extraction), and if possible (3) provide an accurate pedigree. An example of how the questionnaires for behavioral assessment will be analyzed follows.

The use of a standardized methodology and defining criteria (Overall, 1991, 1997, 2001, 2005) for this project removes the need to rely on personal judgments (e.g., "the dog is aggressive") and on nonspecific signs, and instead allows us to use these nonspecific signs (e.g., response when pushed from the bed, response when verbally reprimanded) and the type of reaction within each contextual category evaluated (e.g., bark, growl, snarl, lift lip, snap, bite, withdraw) to gauge the reactivity, severity, and intensity of the reaction in an unambiguous manner. In the case of our aggression questionnaire (CBGP: AGG), *reactivity* is defined as the number of categories in which the dog reacts inappropriately as a proportion of the total number of categories, *severity* is the score of how much the dog reacts given the total number of points available if the dog exhibited all reactions in all categories, and *intensity* can be considered the total number of points accrued for all reactions divided by the number of categories in which the dog reacts.

Such an approach also allows the use of repeated measures for (a) stability of behavior; (b) treatment assessment; and (c) for comparisons within or across families, age groups, sexes, or breeds. Responses for different populations of dogs (e.g., families within breeds, breeds within related groups, or across related vs. unrelated breeds) can then be compared for age and sex. This approach also allows us to gauge reliability and validity, measures that are too often missing from veterinary behavioral studies (Martin and Bateson, 1986).

If we hope to understand the genetic bases of these behaviors and behavioral pathologies, it is essential that we use measurements or assessments that are repeatable and consistent, and as free as possible from random errors (in other words, that the behavioral assessments are reliable), and that we are measuring what we think we are measuring, not someone's biased opinion of a complex process (that is to say that the behavioral assessments are valid). Achieving this goal is not possible if we ask about people's impressions of the behaviors rather than assessing the behaviors themselves (see Taylor and Mills, 2006, this volume).

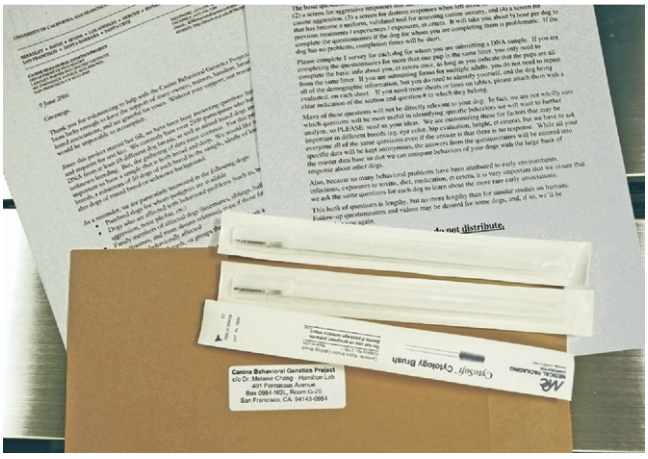

Figure Contents of kits sent to dog owners.

Even in situations of complex inheritance, our understanding of heritable canine somatic conditions (Todhunter et al., 2003; Carrier et al., 2005; Chase et al., 2005) is more advanced than our understanding of putative, heritable canine behavioral conditions. One major reason for this difference is that behavioral assessments have historically lacked rigor because of a lack of reliable and valid measures or procedures. The CBGP approach is designed to redress such concerns and to provide much needed data about behavioral phenotypes and their underlying genetic associations.

The solicitation approach is two-tiered: owners complete a short questionnaire online (see Appendix A) to submit their colntact information and limited demographic and behavioral information about their dog(s). We then send a participation kit including buccal swabs (adequate for small searches of microsatellite markers) (Figure), and, if the dog, condition, or initial findings are of interest, the longer, more detailed CBGP questionnaire packet. Owners return the questionnaire and biological samples along with a pedigree (if available). Subsequently, a blood sample (needed for larger SNP-based whole genome screens) and a video of suites of specific behaviors may be requested. If interested owners do not have access to the Internet, they may communicate with us by phone or mail.

The CBGP questionnaire packet (Appendix B) is derived from continually updated, previously published questionnaires (Overall, 1991, 1997, 2001, 2007) that have been tested in numerous clinical situations (Overall et al., 2001; Overall and Dunham, 2002). Diagnostic definitions follow those of Overall (1997, 2005, 2007).

The current complete version of the CBGP questionnaire packet follows. The authors welcome distribution of this packet, participation and questions from clients with potentially interesting dogs, and participation and questions from breeders. More complete information

about the mission and aims of the CBGP is available on the Web site: http://psych.ucsf.edu/K9BehavioralGenetics/.

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Appendix A: Canine Behavioral Genetics Project (CBGP)- Initial Short Survey Questionnaire

This questionnaire is designed to collect data on the owner/client's experience with their dog breed and any behavioral/medical history for each participating dog. The data collected will be confidential and will NOT be sold or shared to outside parties.

Answering questions:
For YES/NO answers please mark an "X" for the appropriate answer. If there is not enough room to answer a question, continue in the available space provided in the "Comments or additional answers to questions" space or on another piece of blank paper, with the appropriate question number.

If you have more then one dog, please fill out one questionnaire for each participating dog.

For any questions or concerns, email K9BehavioralGenetics@lppi.ucsf.edu

Thank you!

A FEW EXAMPLES:

OWNER/CLIENT EXAMPLE

	YES	NO
1. How did you learn about the CBGP? *(E.g., email, friend [Name the contact], online group/Web site)* **Online Yahoo group**		
2. Are you currently a dog breeder?	X	
3. If you said NO to #2 but were a dog breeder in the past, then what year(s)?		
4. List present and past breeds you have bred: **German Shepherd Dogs**		
5. Do you show your dog(s) in competition?	X	
6. Are you involved in dog breed groups (i.e. dog clubs, online groups, etc.)?	X	
7. Have you assisted in the development of a questionnaire pertaining to your dog's breed?		X
8. If yes, name of the group or association who developed the questionnaire:		

DOG HISTORY EXAMPLE

Name of Dog: MAX

Questions #1 and #2 refer to MALE dogs only. For Female dogs, proceed to Question 3.

Regarding Only MALE dogs (#1 & #2):	YES	NO
1. Are they neutered?	*X*	
2. If yes, has their semen been saved?		*X*
3. Does this dog have pedigree paperwork (with at least 3-4 generations)?	X	
4. Is there any behavioral information available for the previous 3-4 generations?		*X*
5. Name of your dog's breeder (if known, provide name, email or mailing address, and/or phone number): ***Best Dog Breeder Inc., 123 Street St., Anytown, CA, 98765***		

CBGP- Initial Short Survey Questionnaire

OWNER/CLIENT

	YES	NO
1. How did you learn about the CBGP? *(e.g. email, friend [Name the contact], online group/Web site)*		
2. Are you currently a dog breeder?		
3. If you said NO to #2 but were a dog breeder in the past, then what year(s)?		
4. List present and past breeds you have bred:		
5. Do you show your dog(s) in competition?		
6. Are you involved in dog breed groups (i.e. dog clubs, online groups, etc.)?		
7. Have you assisted in the development of a questionnaire pertaining to your dog's breed?		
8. If yes, name of the group or association who developed the questionnaire:		

CBGP- Initial Short Survey Questionnaire

DOG

- You are welcome to make as many copies of this form as needed.
- *This section regards your dog(s). If you have more then one dog, please fill out one dog questionnaire for each dog.*

Name of Dog: _____

Questions #1 and #2 regard to MALE dogs only. For Female dogs, proceed to Question 3.

Regarding Only MALE dogs (#1 & #2): YES NO

1. Is HE neutered?
2. If yes, has his semen been saved?

3. Does this dog have pedigree paperwork (with at least 3-4 generations)?
   a. If yes, can you provide a pedigree copy to this project? *(Enclose a copy with swab samples)*
   b. *If you are unable to provide a copy, then state a reason why:*

4. Is there any behavioral information available for the previous 3-4 generations?
   (Do you know if there are/were any BEHAVIORAL concerns with related family members?)
5. Name of your dog's breeder *(if known, provide name, email or mailing address, and/or phone number):*

6. Does this dog have any BEHAVIORAL concerns?
7. If yes, what type of BEHAVIOR problem *(e.g. panic, anxiety, separation anxiety, aggression to dogs, shy with humans, et cetera)*?

8. Does this BEHAVIORAL concern run through their pedigree line?
   a. *Do you know of the same or similar BEHAVIORAL concerns in his or her siblings, parents, and/or other related members?*
   b. Can you list which members and their BEHAVIORAL concerns *(e.g., half-brother – separation anxiety)*?

9. List medication(s) for the diagnosed BEHAVIORAL problem, if available:

10. List any MEDICAL concerns that run through their pedigree line *(e.g., deafness, epilepsy, blindness)*:

11. Are you aware of any other dogs related to this one that are participating in this project?
    (If known, please state the name of relative and relationship. e.g., Mariah – sister)

12. Coat and color markings:
13. Comments or additional answers to questions:

If you have another dog to submit, please continue onto the other side of this sheet or to another copy of this questionnaire.

Appendix B: Canine Behavioral Genetics Project (CBGP)

Instructions for completion of the history packet for canine behavioral genetics study:

The basic questionnaire—that must be completed for **all** dogs—has 4 parts: (1) a short questionnaire about you and your household **(DEMO & DOGH),** (2) a screen for distress responses when left alone or when exposed to noise that has become a uniform, validated tool for assessing specific types of canine anxiety **(SANP),** (3) a screen for aggressive responses that has become a uniform, validated tool for assessing canine aggression **(AGG)**, and (4) a screen for previous treatments / experiences / exposures **(PRT).** If you have a dog who exhibits repetitive, stereotypic behavior, there is a 5th questionnaire for you to complete: Stereotypic and Ritualistic Behavior History **(SRBH).**

Most of the responses called for are ticks in appropriate places, so it will take you about ½ hour per dog to complete the questionnaires if the dog for whom you are completing the forms is problematic. If the dog has no problems, completion times will be short.

Please complete 1 survey for each dog for whom you are submitting a DNA sample. If you are completing the questionnaires for more than one pup in the same litter, you only need to complete the basic info about you, et cetera, once, as long as you indicate that the pups are all from the same litter. If you are submitting forms for multiple adults, you do not need to repeat all of the demographic information, but you do need to identify yourself, and the dog being evaluated, on each sheet. *If you need more sheets or lines on tables, please attach them with a clear indication of the section and question number to which they belong.*

Many of these questions will not be directly relevant to your dog. In fact, we are not wholly sure which questions will be most useful in identifying specific behaviors we will want to further analyze, so PLEASE send us your ideas. We are customizing these surveys for factors that may be important in different breeds (e.g., eye color, hip evaluation, height), but we have to ask everyone all of the same questions even if there is no response. Although all your specific data will be kept anonymous, the answers from the questionnaires will be entered into the master database so that we can compare behaviors of your dogs with the large bank of response about other dogs.

Also, because so many behavioral problems have been attributed to early environments, infections, exposures to toxins, diet, medication, et cetera, it is very important that we ensure that we ask the same questions for each dog to learn about the more rare early associations.

This bank of questions is lengthy, but no more lengthy than for similar studies on humans. Follow-up questionnaires and videos may be desired for some dogs, and, if so, we'll be contacting you again. Please remember that all data provided, even your identity, is confidential. If you would like to be acknowledged in any specific way for participation at any level, please let us know.

When completed, please send the forms to:

Canine Behavioral Genetics Project
Steve Hamilton Lab - LPPI
401 Parnassus Ave. – Box 0984-NGL
San Francisco, CA 94143 U.S.A.
Or
Email forms to: **K9BehavioralGenetics@lppi.ucsf.edu**

Owner / client's name: _____

CLIENT: Demographics(DEMO)

Please fill out general information about the owner / client, your household, and all animals.

1. Owner or client's name (first and last names):
2. Owner or client's kennel name (if applicable):
3. Owner's / client's address:
4. Owner's / client's HOME phone no.:
5. Owner's / client's OFFICE phone no.:
6. Owner's / client's fax no.:
7. Owner's / client's e-mail address:

8. Please list the people, **including yourself,** currently living in the household now.

Name	Sex (M/F)	Age (yrs)	Relationship to you (e.g. husband)
			Self

9. Please list all the **animals** in the household.

KEY:
Pet's Name = Common or registered name
Order obtained = The numerical order in which you acquired your pets
Sex = M (Intact/Entire Male), MC (Male Castrated/Neutered/Altered), F (Intact/Entire or Unspayed Female), FS (Spayed/Neutered/Altered Female)
Age obtained = At what age (in months) was your animal when you received it?
Age now = Current age (in months) of the animal
Any medical illness? = Regarding present medical illness
Any behavioral illness? = Regarding present behavioral illness
Y = Yes
N = No

Example:

Pet's Name	Order Obtained	Breed	Sex (M, MC, F, FS)	Age Obtained (months)	Age Now (months)	Any Medical Illness?		Any Behavioral Illness?	
Rizzo	**2**	**Beagle**	MC	**24**	**60**	(**X**) Y	( ) N	( ) Y	(**X**) N
Max	**1**	**German Shepherd**	**MC**	**12**	**48**	( ) Y	(**X**) N	(**X**) Y	( ) N

Please complete:

Pet's Name	Order Obtained	Breed	Sex (M, MC, F, FS)	Age Obtained (months)	Age Now (months)	Any Medical Illness?		Any Behavioral Illness?	
						( ) Y	( ) N	( ) Y	( ) N
						( ) Y	( ) N	( ) Y	( ) N
						( ) Y	( ) N	( ) Y	( ) N
						( ) Y	( ) N	( ) Y	( ) N
						( ) Y	( ) N	( ) Y	( ) N
						( ) Y	( ) N	( ) Y	( ) N
						( ) Y	( ) N	( ) Y	( ) N
						( ) Y	( ) N	( ) Y	( ) N
						( ) Y	( ) N	( ) Y	( ) N
						( ) Y	( ) N	( ) Y	( ) N

Owner / client's name: ____

CBGP: Dog History (DOGH)

The rest of the questionnaire will reflect information about the dogs participating in this study.

Please answer all questions to the best of your ability.

To continue, please complete all CBGP forms (pages 4–24) for one of the following:

a. One set of forms for EACH dog (single or multiple adults, related and unrelated).

OR

b. One set of forms for each LITTER (pups in the same litter).

Make as many copies of the CBGP forms as needed.

10. Dog's Name (Registered name and Call name, if applicable):

11. Breed of Dog:
12. Sex of Dog: ( ) Male ( ) Castrated? ( ) Female ( ) Spayed?
13. How old was the dog when neutered? ________________ months old
14. Has this dog been bred? ( ) Yes ( ) No
15. If you have not yet bred this dog, do you plan on breeding him or her? ( ) Yes ( ) No
16. How tall is your dog (from shoulder to floor)? ________________ inches tall
17. Your dog's weight? ________________ kg
18. What color is your dog? *(e.g. Black, Brindle, Black/Tan, etc.)*
19. What is the EYE color of your dog? Left eye: Right eye:
20. What is the NOSE color of your dog?
21. Dog's date of birth: Day ________________ Month ________________ Year ________________
22. Has this pet had other owners (besides you)? ( ) Yes ( ) No
    a. If YES, how many? ( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) Unknown
    b. Reason for previous owner(s) relinquishment of this animal:

23. Where did you get this dog? *Check the best appropriate answer.*
    c. ( ) Stray / found
    d. ( ) Breeder - serious show / performance breeder
    e. ( ) Breeder - backyard breeder
    f. ( ) SPCA / Humane shelter
    g. ( ) Breed rescue service
    h. ( ) Newspaper adoption ad (not breeder)
    i. ( ) Pet store
    j. ( ) Friend
    k. ( ) From your own breeding
    l. ( ) Other (Please explain):

	YES	If YES, indicate under what circumstances:	NO
24. Does the dog for whom this questionnaire is being completed have any recurrent, sporadic, or periodic bouts of vomiting?	( )		( )
25. Does the dog for whom this questionnaire is being completed have any recurrent, sporadic, or periodic bouts of diarrhea / loose stool?	( )		( )

26. Has your dog been evaluated for any of the following problems, and if so, what was the outcome?	**YES**	**NO**	**OUTCOME?**
a. Thyroidal Illness	( )	( )	
b. Addison's Disease	( )	( )	
c. Cushing's Disease	( )	( )	
d. Hip Dysplasia	( )	( )	
If YES, what method was used to evaluate the hips?	( ) OFA ( ) PennHIP ( ) Other		
e. Elbow Dysplasia	( )	( )	
f. Hearing (BAER testing)	( )	( )	
g. Vision (CERF testing)	( )	( )	
h. Cardiac screened / assessed (e.g. for PDA, et cetera)	( )	( )	

27. Does this dog have any other physical or medical problems – including any concerns about skin, joints, digestion, reproduction, nervous system function (e.g. epilepsy), long-term / serious infections (e.g. Lyme disease), et cetera - that your veterinarian has noted?	( )	( )
28. Is your dog taking any medication for any medical **or** behavioral problems?	( )	( )
29. What foods, including treats, is your dog fed (brand names, please)?		

30. How is your dog exercised / maintained? *Check all that apply.*
    - m. ( ) Allowed to run free, unsupervised
    - n. ( ) Fenced/Kenneled/Run
    - o. ( ) Leash walked
    - p. ( ) Outside, unleashed but supervised
    - q. ( ) Indoors only
    - r. ( ) Outdoors only

31. How is your dog kept when you leave him or her alone?
    - b. ( ) Free in house
    - c. ( ) Free outdoors
    - d. ( ) Indoors kennel / run
    - e. ( ) Outdoor kennel / run
    - f. ( ) Crate indoors
    - g. ( ) Crate outdoors or garage
    - h. ( ) Behind a gate or door in house
    - i. ( ) Other (please specify):

32. What kind of living situation do you have?
    - a. ( ) Apartment
    - b. ( ) Townhouse / Condominium
    - c. ( ) House with small yard
    - d. ( ) House with large yard
    - e. ( ) Farm

33. Do you know how many animals were in this pet's litter? ( ) YES ( ) NO
    # _____ Females # _____ Males

	YES	**Specify Problem:**	**NO**	**DON'T KNOW**
34. Are any litter mates who were / are affected with any **medical** problems?	( )		( )	( )
35. Are any litter mates who were / are affected with any **behavioral** problems?	( )		( )	( )

36. Where does your pet sleep? *Check all that apply; we know pets move at night.*
    a. ( ) In or on your bed
    b. ( ) On its own bed in your bedroom
    c. ( ) In its crate in your bedroom
    d. ( ) On its own bed in another room
    e. ( ) In a crate in another room
    f. ( ) On the floor next to your bed
    g. ( ) In another room, voluntarily, chooses another location elsewhere.
    h. ( ) In another room, (locked out of your bedroom), chooses another location elsewhere.
37. What is your dog's obedience school / training history?
    a. ( ) No school
    b. ( ) Trained yourself
    c. ( ) Puppy kindergarten
    d. ( ) Group lessons - basic
    e. ( ) Group lessons - advanced
    f. ( ) Private trainer at house or with you at their office – Specify:
    - ■ ( ) Private trainer - sent to trainer
    - ■ ( ) Agility
    - ■ ( ) Flyball
    - ■ ( ) Specialty training (hunting, herding, et cetera), please specify:

	YES	Specify Titles:	NO
38. Does the dog have any titles?	( )		( )

39. How well does this dog do with the following commands / requests:	Perfectly	OK, Needs work	Badly
■ Sit	( )	( )	( )
■ Stay	( )	( )	( )
■ Down / lie down	( )	( )	( )
■ Wait	( )	( )	( )
■ Heel	( )	( )	( )
■ Fetch	( )	( )	( )
■ Leave it / drop it	( )	( )	( )
■ Take it	( )	( )	( )
■ Other (Please specify):	( )	( )	( )

	0	1	2	3	4	5	>5
40. How many total bites has your dog inflicted on any **human**?	( )	( )	( )	( )	( )	( )	( )
41. How many bites to **humans** broke the skin?	( )	( )	( )	( )	( )	( )	( )
42. How many total bites has your dog inflicted on any **dog**?	( )	( )	( )	( )	( )	( )	( )
43. How many bites to **dogs** broke the skin?	( )	( )	( )	( )	( )	( )	( )

a. For dogs that have bitten HUMANS, which category best describes your dog's orientation to the person bitten?
   ( ) Dog bites only when the victim's back is turned (bites from behind).
   ( ) Dog bites only from the front of the victim.
   ( ) Dog bites from any direction.

b. For dogs that have bitten DOGS, which category best describes your dog's orientation to the dog bitten?
   ( ) Dog bites only when the victim's back is turned (bites from behind).
   ( ) Dog bites only from the front of the victim.
   ( ) Dog bites from any direction.

Owner / client's name: _____

CBGP: Separation Anxiety and Noise Phobias (SANP)

Please answer the following questions to the best of your ability.

The first set of these questions deals with an **"actual absence"**—i.e., the client actually leaves the house and the dog is either alone or totally without the client. The second set deals with **"virtual absence"**— i.e., the client is home, but not accessible because the door is closed or the dog is barricaded in another room. The questions are the same for each, but please answer both.

To answer questions:

Check NO if the dog on whom you are reporting does not react in the listed circumstance.
Check UNKNOWN if you don't know.
Check YES if the dog reacts. Please evaluate the extent of the reaction from the accompanying list below.

IF YES:
0 = 100% of time (always)
1 = <100% of time but >60% (more often than not)
2 = 40-60% of time (about equally)
3 = >0% of time but < 40% (less often than not)

FORMER BEHAVIOR?

Check THEN if your dog formerly exhibited the behaviors but has changed. Then write what he or she currently does in the NOW column.

EXAMPLE ANSWERS:

Behaviors during an ACTUAL absence:

				FORMER BEHAVIOR?	
YES	**UNKNOWN**	**NO**	**BEHAVIOR**	**THEN**	**NOW** (Specify behavior)
( )0 (**x**)1 ( )2 ( ) 3			1. Destructive behavior when separated from owner/client.		
( )0 ( )1 ( )2 ( ) 3		**X**	2. Urination when separated from owner/client.	**x**	**Hides under the table.**
( )0 ( )1 ( )2 (**x**) 3			3. Defecation when separated from owner/client.		
( )0 ( )1 ( )2 ( ) 3	**x**		4. Vocalization when separated from owner/client.		
( )0 ( )1 ( )2 ( ) 3	**x**		5. Salivation when separated from owner/client.		

Behaviors during an ACTUAL absence:

			FORMER BEHAVIOR?	
YES	**UNKNOWN**	**NO**	**BEHAVIOR**	**THEN**	**NOW** (Specify behavior)
1. ( )0 ( )1 ( )2 ( ) 3			1. Destructive behavior when separated from owner/client.		
2. ( )0 ( )1 ( )2 ( ) 3			2. Urination when separated from owner/client.		
3. ( )0 ( )1 ( )2 ( ) 3			3. Defecation when separated from owner/client.		
4. ( )0 ( )1 ( )2 ( ) 3			4. Vocalization when separated from owner/client.		
5. ( )0 ( )1 ( )2 ( ) 3			5. Salivation when separated from owner/client.		

Behaviors during a VIRTUAL absence:

			FORMER BEHAVIOR?	
YES	**UNKNOWN**	**NO**	**BEHAVIOR**	**THEN**	**NOW** (Specify behavior)
6. ( )0 ( )1 ( )2 ( )3			6. Destructive behavior when separated from owner/client.		
7. ( )0 ( )1 ( )2 ( )3			7. Urination when separated from owner/client.		
8. ( )0 ( )1 ( )2 ( )3			8. Defecation when separated from owner/client.		
9. ( )0 ( )1 ( )2 ( )3			9. Vocalization when separated from owner/client.		
10. ( )0 ( )1 ( )2 ( )3			10. Salivation when separated from owner/client.		
11. ( )0 ( )1 ( )2 ( )3			11. Reaction during thunderstorms: Type of response - please check all that apply: ( ) salivate ( ) defecate ( ) urinate ( ) destroy ( ) escape ( ) hide ( ) tremble ( ) vocalize ( ) pace ( ) freeze ( ) other; specify what, please		

12. ( )0 ( )1 ( )2 ( )3	12. Reaction to fireworks: Type of response - please check all that apply: ( ) salivate ( ) defecate ( ) urinate ( ) destroy ( ) escape ( ) hide ( ) tremble ( ) vocalize ( ) pace ( ) freeze ( ) other; specify what, please
13. ( )0 ( )1 ( )2 ( )3	13. Reaction to other noises Type(s) of Noise(s): (e.g. vacuum cleaners, leaf blowers, weed whackers, dump trucks, sirens, alarm systems, et cetera): Type of response - please check all that apply: ( ) salivate ( ) defecate ( ) urinate ( ) destroy ( ) escape ( ) hide ( ) tremble ( ) vocalize ( ) pace ( ) freeze ( ) other; specify what, please

Behaviors for Noise Phobia:

If you noted any noise reactions in your answers for questions 1 through 13 of CBGP: Separation Anxiety and Noise Phobias (SANP), please answer the following questions as relevant:

14. If your dog reacts in any of the ways described above to noises, and this is a working dog (meaning the ACTUAL work for which the dog was bred, such as livestock work for Border Collies, retrieving fowl for Labrador Retrievers—not "herding" the cats or retrieving balls), is the intensity of the dog's reaction to noise different while working?
    a. ( ) Yes, it is non-existent.
    b. ( ) Yes, it is less severe.
    c. ( ) No, it is the same.
    d. ( ) Yes, it is more severe.

    Please describe:

15. If you engage your dog in an organized activity (a dog sport such as agility or flyball, obedience, etc.), is the dog's intensity of reaction to noise different while engaged in that activity?
    a. ( ) Yes, it is non-existent.
    b. ( ) Yes, it is less severe.
    c. ( ) No, it is the same.
    d. ( ) Yes, it is more severe.

    Please describe:

16. How frequently do noise events such as thunder, fireworks, or gunshots occur in the dog's environment?
    a. ( ) Never
    b. ( ) Infrequently (only a few times a year)
    c. ( ) Regular (averaging once a month or so)
    d. ( ) Frequently (a few times a month or more)

    What are these noises?_____

    If the dog has undergone a change of environment, or is in more than one environment (as a result of travel, multiple homes, away for training, etc.) and this situation is relevant, explain below:

17. Has this dog ever been treated for noise sensitivities or phobias? Please circle all relevant choices below:
    a. ( ) Acepromazine ("Ace")
    b. ( ) Rescue Remedy
    c. ( ) Benzodiazepines (i.e., Valium, Xanax)
    d. ( ) Other medications (please describe)_____

    e. ( ) Other "natural" or holistic remedies (please describe)_____

    f. ( ) Desensitization (tapes, CDs, videos)_____

    g. ( ) Other (please describe)_____

18. Do you have additional comments about your dog's reaction to noise, or is there anything else about his or her behavior when exposed to noise that you think we should know?

Owner / client's name: _____

CBGP: Aggression (AGG)

This part of the questionnaire looks at your dog's response to various situations (stimuli).

Please read through each item and check the relevant column. Feel free to add comments or additional explanations where you think it is appropriate (see example). This part of the questionnaire will take 5-10 minutes to complete.

To answer:
As you evaluate your dog, check the appropriate reaction from the accompanying list below.

KEY:
NR = no reaction
SL = snarl (noise)
L = lift lip (can see corner teeth)
BK = bark (aggressive, **not** an alerting bark)
G = growl (**not** a play growl)
SP = snap (no connection with skin)
BT = bite (connects with skin, regardless of damage)
WD = withdraw from or avoid situation
NA = not applicable (animal has never been in that situation)

FORMER BEHAVIOR?
Check THEN if your dog formerly exhibited the behaviors but has since changed his or her response. Then, in the NOW column, write what he or she currently does as a response.

*For any of the categories marked with an asterisk, please note the dog's other body postures, including position and activity of tail, position of ears, position of body, whether hair is up and where, and any other information you think is important. For additional comments, write on a blank sheet of paper any observations with the corresponding questionnaire section and action number.

+If you notice that your dog reacted to categories 29, 30, 33, 34, or 35, does he or she react only as a last resort?

For Example:

ACTION	NR	SL	L	BK	G	SP	BT	WD	NA	FORMER BEHAVIOR? THEN	FORMER BEHAVIOR? NOW (Specify behavior)
1. Take dog's food dish with food		X									
2. Dog approaches dog while eating*			X								
3. Dog on leash approached by known dog on street*+						X					

Additional answers/information provided by owner/client:

Aggression (AGG)

(2) His ears are pointing up, and his tail is up too. He looks like he will charge the other dog.

(3) He reacts as soon as the known dog approaches him.

Owner / client's name: _____

CBGP: Aggression (AGG)

ACTION	NR	SL	L	BK	G	SP	BT	WD	NA	FORMER BEHAVIOR? THEN	FORMER BEHAVIOR? NOW (Specify behavior)
1. Take dog's food dish with food											
2. Take dog's empty food dish											
3. Take dog's water dish											
4. Take food (human) that falls on floor											
5. Take rawhide											
6. Take real bone											
7. Take biscuit											
8. Take toy											
9. Human approaches dog while eating*											
10. Dog approaches dog while eating*											
11. Person approaches dog while playing with toys*											
12. Dog approaches dog while playing with toys*											
13. Person approaches/disturbs dog while sleeping*											
14. Dog approaches/disturbs dog while sleeping*											
15. Step over dog											
16. Push dog off bed/couch											
17. Reach toward dog*											
18. Reach over head*											
19. Put on leash*											
20. Push on shoulders											
21. Push on rump											
22. Towel feet when wet											
23. Bathe dog											
24. Groom dog's head*											
25. Groom dog's body*											
26. Stare at											
27. Take muzzle in hands and shake*											
28. Push dog over onto back*											
29. Stranger knocks on door+											
30. Stranger enters room*+											
31. Dog in car at toll booth*											
32. Dog in car at gas station*											
33. Dog on leash approached by known dog on street*+											
34. Dog on leash approached by unknown dog on street*+											
35. Dog on leash approached by person on street*+											
36. Dog in yard—person passes*											
37. Dog in yard—unknown dog passes*											
38. Dog in yard—known dog passes*											
39. Dog in vet's office*											
40. Dog in boarding kennel*											
41. Dog at groomer*											
42. Dog yelled at*											
43. Dog corrected with leash* *(Please define what you mean by a "correction")*											

44. Someone raised voice to owner in presence of dog
45. Someone hugs or touches owner in presence of dog*
46. Squirrels, cats, small animals approach dog
47. Bicycles, skateboards
48. Crying infant*
49. Playing with 2-year-old children*
50. Playing with 5-7-year-old children*
51. Playing with 8-11-year-old children*
52. Playing with 12-16-year-old children*

Additional answers/information provided by client/owner

Owner / client's name: _____

CBGP: Previous Treatments (PRT)

This portion of the questionnaire investigates types of manipulations used on the dog as a behavioral modifier.

In the "ACTIVITY TRIED?" column, please check the items below according to which treatment your dog has experienced, and indicate the outcome. If your dog is a rescue dog and/or someone else (besides you) has formerly tried any of these activities, please check the asterik* column and indicate the response, if known.

FOR EXAMPLE:

	Activity tried?	*	Outcome (Dog's Response)
1. Stare at or "stare down"	X		Dog growled.
2. Grab by jowls and shake		X	Dog bit hand. Broke skin on hand of owner.

Previous Treatments

	Activity tried?	*	Outcome (Dog's response)
1. Stare at or "stare down"			
2. Grab by jowls and shake			
3. Get an additional dog as a companion for this one			
4. Step on leash or choke collar and force down			
5. Blow in nose or face			
6. Buy different types of dog toys (ex: Kongs, etc.)			
7. Metal choke collar			
8. Prong collar			
9. Halti, head collar, or Gentle Leader			
10. Harness			
11. No-pull or Sporn harness			
12. Martingale collar			
13. Scruffy Guider			
14. Fabric choke collar			
15. Electronic or shock collar controlled by owner			
16. Electronic or shock collar controlled by trainer			
17. Electronic or shock collar—remote-control or bark-activated			
18. Citronella collar			
19. Citronella spray			
20. Throw a tin or can of pennies			
21. Water pistol			
22. Whistle			
23. Foghorn			
24. Hit dog with hand			
25. Hit dog with leash			
26. Hit dog with empty plastic soda bottle			
27. Hit dog with whiffle ball bat			
28. Hit dog with chain			
29. Hit dog with board, plank, or baseball bat			
30. Hit dog under chin			
31. Step on dog's toes			
32. Knee dog in chest / belly			
33. Kick dog			
34. Bite dog			

35. "Alpha roll" *[Hold dog in a spread eagle position on back]*
36. "Dominance down" *[Hold dog down on side, legs extended, head flat]*
37. Growl at dog
38. Yell or scream at dog
39. Long down
40. Sit and wait
41. "Time out" *[If YES, indicate where, how, and length of time]*
42. Praise for good behavior
43. Crate
44. Kennel outdoors
45. Fenced yard
46. Invisible fence
47. Isolate somewhere in house *[if YES, indicate where in the house and length of time]*
48. Board at vet's or kennel (indicate establishment)
49. Use whip on dog
50. Cattle prod
51. "String up" or hang by leash and collar (all 4 paws off ground)
52. "String up" or hang by leash and collar (only front paws off ground)
53. Pop and jerk leash
54. Yank or pull on leash
55. Tie up—physically
56. Tie out or stake on very short lead hooked to wall or floor
57. Muzzle
58. Increase exercise
59. Increase play
60. Give treats for good behavior
61. Deprive of food
62. Thrown against wall
63. Beat with your fists
64. Shove dog's nose / face into urine, feces, or destruction
65. Use blow torch on dog
66. List any other technique recommended or not listed:

Owner / client's name: _____

CBGP: Stereotypic and Ritualistic Behavior History (SRBH)

Please complete this form ONLY if your pet is showing any repetitive, ritualistic behaviors that you find troublesome or about which you are concerned. If not, please go to the LAST PAGE.

1. Which of the following category/categories below fits your dog's behavior? *(Check as many categories that apply to the dog's behavior. Then check the best description that relates to the selected behavior.)*

a. ( ) Grooming	( ) Chewing
	( ) Biting
	( ) Licking
	( ) Plucking
	( ) Barbering
	( ) Sucking self
b. ( ) Hallucinatory	( ) Staring
	( ) Tracking
	( ) Attacking
	( ) "Invisible prey"

c. ( ) Consumptive	( ) Consuming rocks
	( ) Dirt
	( ) Other objects
	( ) Wool-fabric chewing or sucking
	( ) Licking or gulping air
d. ( ) Locomotory	( ) Circling
	( ) Tail-chasing
	( ) Freezing
	( ) Scratching
e. ( ) Vocalization	( ) Rhythmic barking
	( ) Barking
	( ) Howling
	( ) Growling

Owner / client's name: _____

CBGP: Stereotypic and Ritualistic Behavior History (SRBH)

Check the appropriate answer (YES/NO/UNCERTAIN) for each of the following questions. Some of the answers may need more detailed explanations. If so, please write the answer on a blank piece of paper, indicating the questionnaire section and appropriate question number.

FOR EXAMPLE:

	YES	NO	UNCERTAIN
2. Was there a change in the household or an event that was associated with the development of the behavior?	*If so, please describe in detail.* (X)	( )	*UNCERTAIN – There may have been. Please explain.* ( )

2. YES – Our dog's behavior changed after we introduced him to our new baby.

CONTINUE WITH QUESTIONNAIRE:

	YES	NO	UNCERTAIN
2. Was there a change in the household or an event that was associated with the development of the behavior?	*If so, please describe in detail.* ( )	( )	*UNCERTAIN – There may have been. Please explain.* ( )
3. Is there any time of day when the behavior seems more or less intense?	*If so, please describe in detail what is usually going on at that time of day.* ( )	( )	*No one is home long enough to know.* ( )
4. Is there a person/another pet in the presence of whom the behavior seems more intense?	*If so, who is this and what is their association to the pet?* ( )	( )	*No one is home long enough to know.* ( )
5. What is the attitude of the pet while performing the behavior (e.g., distressed, self-absorbed, fearful, frantic)?			
6. Does the animal respond to its name or seem aware of its surroundings while in the midst of the behavior?	( )	( )	( )
7. Is the dog aware that you are calling him or her?	*If so, how can you tell?* ( )	( )	*No one is home long enough to know.* ( )
8. Can you convince the pet to stop the behavior by either of the following:			
a. Calling him or her.	( )	( )	( )
b. Using physical restraint.	( )	( )	( )
9. List what kinds of things (e.g., noises, treats, toys), if any, will interrupt the behavior once it has started:			
10. Is there a location in which the animal prefers to perform the behavior?	*If so, where?* ( )	( )	( )

11. For ingestion, list what types of objects are consumed: (Please be as specific as possible–what type of rug, fabric, of sweater?)

12. Does any event or behavior routinely occur immediately before the behavior begins?	*If so, what?* ( )	( )	( )
13. Does any event or behavior routinely occur immediately after the behavior ceases?	*If so, what?* ( )	( )	( )
14. Has the pet's general behavior changed in any way since the onset of the atypical behavior (e.g., the dog is more aloof, more aggressive, more withdrawn, more or less playful)?	*If so, please specify?* ( )	( )	( )
15. Has the pet's diet recently been changed?	*If so, what—specifically—was the change?* ( )	( )	( )
16. Regarding your concerns, how old do you think your pet was when its ritualistic behavior began?	_____ months		
17. Did anyone else in the dog's family exhibit these or similar behaviors?	( )	( )	( )

If YES, please check all relatives known to be affected, and if they exhibited different forms of ritualistic behaviors, please specify:

RELATIVE	**PLEASE SPECIFY IF THE RELATIVE EXHIBITED A DIFFERENT FORM OF RITUALISTIC BEHAVIOR**
a. Mother	
b. Father	
c. Sister	
d. Brother	
e. Grandmother	
f. Grandfather	
g. Cousin	
h. Son	
i. Daughter	
j. Other *(Unsure if a relative exhibited behavior, or they are distantly related.)*	

Finally, here are the last few questions!!!!

	YES	**NO**
1. Are these questionnaires accompanied by a PEDIGREE for each participating dog?	**( )**	**( )**
****PLEASE do not forget to provide a <u>pedigree</u> for each participating dog, if possible.***		
If you know or think you have a FAMILIAL BEHAVIORAL PROBLEM, please assign a CODE for each family member on the pedigree. Below is the list of the codes to be used: **➢ KA = Affected** **➢ KU = Known to be unaffected** **➢ TA = Thought to be affected** **➢ TU = Thought to be unaffected** **➢ NA = Information is not available**		
2. Can you provide a video of the dog if we request one?	**( )**	**( )**
3. Is there anything else you'd like us to know?	**( )**	**( )**

Your confidentiality will be respected. Also, please help us to improve these questionnaires. We'd love to hear your ideas.

THANK YOU!