Comparison of Visual and DNA Breed Identification of Dogs and Inter-Observer Reliability

V.L. Voith[i], R. Trevejo[ii], S. Dowling-Guyer[iii], C. Chadik[i], A. Marder[iii], V. Johnson[i], K. Irizarry[i], J. Marilo

[i]College of Veterinary Medicine, Western University of Health Sciences, Pomona, 91766, United States of America [ii]Oregon State University, Beaverton, 97006, United States of America
[iii]Center for Shelter Dogs, Animal Rescue League of Boston, Boston, 02116, United States of America

INTRODUCTION

A previous study[1] found little correlation between dog adoption agencies' identification of probable breed composition with identification of breeds by DNA analysis. Because these dogs may have been identified by only one person, we presented one-minute video clips of the same 20 dogs to over 900 people who were engaged in dog-related professions or services. We were interested in how often their visual identifications matched DNA identifications and how often the respondents agreed as to the most predominant breed of dogs that they identified as mixed breeds.

MATERIALS AND METHODS

The Dogs: Twenty privately-owned dogs from a pool of dogs that had been volunteered by their owners to participate in a study. The dogs had been adopted from 17 different locations. There were 12 Spayed Females, 1 Intact Female, and 7 Castrated Males. All dogs had permanent canine teeth and were 0.5-12 years old. There were 5 dogs in each of the weight ranges: < 20 pounds, 21-40 pounds, 41-60 pounds, and > 60 pounds. All were identified as mixed breeds by DNA analysis.[2]

The Respondents: The 986 participants completed all or part of the identification quiz at 30 locations throughout the United States. Many of these sites were at regional or national meetings with participants from several states; 923 participants met the inclusion criteria of identifying their profession or dog-related service and indicated that they have been asked what breed a dog appears to be. The majority of respondents were or had been in animal control/sheltering and/or veterinary medical fields.

The Quiz: One-minute, color video clips of each dog, depicted in front of a screen with a grid of 1-foot squares, were shown to the participants. The dogs were allowed to move about and full bilateral, frontal views, and close-ups of the heads were always shown. Participants were asked if they thought the dogs were purebreds or not and if so, what breed or predominate breed(s).

RESULTS [3]

For 14 of the dogs, fewer than 50% of the respondents visually identified breeds of dogs that matched DNA identification. For only 7 of the dogs was there agreement among more than 50% of the respondents regarding the most predominant breed of a mixed breed and in 3 of those cases the visual identification did not match the DNA analysis.

CONCLUSIONS

This study reveals large disparities between visual and DNA breed identification as well as differences among peoples' visual identifications of dogs. These discrepancies raise questions concerning the accuracy of databases which supply demographic data on dog breeds for publications such as public health reports, articles on canine behavior, and the rationale for public and private restrictions pertaining to dog breeds.

REFERENCES

1. V.L. Voith, E. Ingram, K. Mitsouras, K. Irizarry, "Comparison of Adoption Agency Breed Identification and DNA Breed Identification of Dogs," Taylor and Francis, Journal of Applied Animal Welfare Science, vol. 12, no. 3, pp. 253-262, 2009.
2. MARS VETERINARY™, Lincoln, NE USA 68501-0839. Breed composition less than 12.5% was not reported; reference data based on 130 AKC registered dogs; an average of 84% accuracy in F1 purebred crosses.
3. V.L. Voith, R. Trevejo, S. Dowling-Guyer, C. Chadik, A. Marder, V. Johnson, K. Irizarry, "Comparison of Visual and DNA Breed Identification of Dogs and Inter-Observer Reliability," Scientific and Academic Publishing, American Journal of Sociological Research, vol. 3, no. 2, pp. 17-29, 2013. http://article.sapub.org/10.5923.j.sociology.20130302.02.html

Western University OF HEALTH SCIENCES — College of Veterinary Medicine

ANIMAL RESCUE LEAGUE of BOSTON

VISUAL ID: Labrador Retriever (39.9% of 855 Respondents) DNA ID: 25% each: American Staffordshire Terrier, Saint Bernard; 12.5%: Chinese Shar-Pei — 1

VISUAL ID: Golden Retriever (39.3% of 796 Respondents) DNA ID: 25% each: American Eskimo Dog, Golden Retriever, Nova Scotia Duck-Tolling Retriever, Rottweiler — 2

VISUAL ID: Border Collie (45.7% of 771 Respondents) DNA ID: 25% each: English Springer Spaniel, German Wirehaired Pointer — 3

VISUAL ID: Pug (37.0% of 835 Respondents) DNA ID: 25%: Lhasa Apso; 12.5% each: Australian Cattle Dog, Bischon Frise, Italian Greyhound, Pekingese, Shih Tzu — 4

VISUAL ID: German Shepherd Dog (59.1% of 777 Respondents) DNA ID: 12.5% each: Australian Shepherd Dog, Chow Chow, Dalmatian, German Shepherd Dog, Siberian Husky — 5
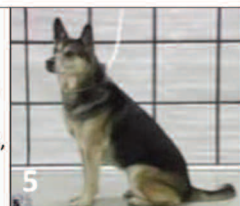
VISUAL ID: German Shorthaired Pointer (33.0% of 820 Respondents) DNA ID: 12.5% each: Chow Chow, Dachshund, Nova Scotia Duck-Tolling Retriever — 6

**VISUAL ID:** Corgi (56.7% of 793 Respondents) DNA ID: 12.5% each: American Water Spaniel, Black Russian Terrier, Pomeranian, Shih Tzu, Tibetan Terrier — 7
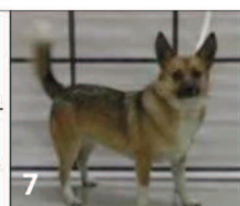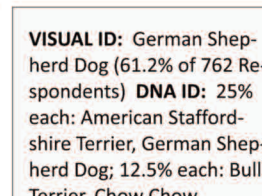
VISUAL ID: Pit bull (39.5%)/ American Staffordshire Terrier (12.1%) (51.6% of 787 Respondents) DNA ID: 25% each: Chow Chow, French Bull Dog; 12.5% each: Clumber Spaniel, Dalmatian, Gordon Setter, Great Dane — 8
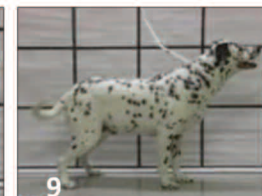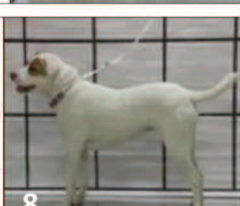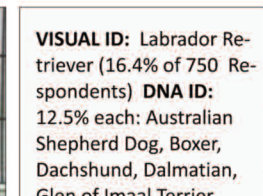
VISUAL ID: Dalmatian (94.8% of 674 Respondents) DNA ID: 25%: Dalmatian; 12.5% each: Boxer, Chow Chow, Newfoundland — 9
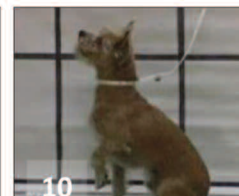
VISUAL ID: Yorkshire Terrier (16.6% of 751 Respondents) DNA ID: 25% each: Australian Shepherd Dog, Pekingese — 10

VISUAL ID: German Shepherd Dog (61.2% of 762 Respondents) DNA ID: 25% each: American Staffordshire Terrier, German Shepherd Dog; 12.5% each: Bull Terrier, Chow Chow — 11

VISUAL ID: Labrador Retriever (16.4% of 750 Respondents) DNA ID: 12.5% each: Australian Shepherd Dog, Boxer, Dachshund, Dalmatian, Glen of Imaal Terrier — 12

VISUAL ID: German Shorthaired Pointer (14.4% of 790 Respondents) DNA ID: 12.5% Alaskan Malamute — 13

VISUAL ID: German Shepherd Dog (30.8% of 844 of Respondents) DNA ID: 25% each: German Shepherd Dog, Standard Schnauzer; 12.5%: English Setter — 14

VISUAL ID: Labrador Retriever (86.9% of 831 Respondents) DNA ID: 12.5% each: Chow Chow, Golden Retriever, Gordon Setter, Saint Bernard — 15

VISUAL ID: Australian Shepherd Dog (23.9% of 774 Respondents) DNA ID: 12.5% each: Australian Shepherd Dog, Boxer, Golden Retriever — 16
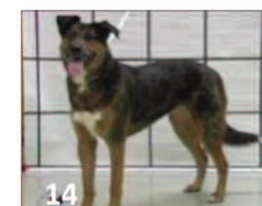
VISUAL ID: Chihuahua (55.5% of 831 Respondents) DNA ID: 12.5% each: Cavalier King Charles Spaniel, Chihuahua, Shih Tzu — 17

VISUAL ID: Cairn Terrier (23.5% of 697 Respondents) DNA ID: 50%: Miniature Pinscher; 12.5%: Dachshund — 18

VISUAL ID: Collie (14.6% of 796 Respondents) DNA ID: 25%: Border Collie; 12.5% each: Bassett Hound, Cocker Spaniel — 19

VISUAL ID: Shih Tzu (43.2% of 657 Respondents) DNA ID: 25%: Shih Tzu; 12.5% each: Cocker Spaniel, Pekingese, Miniature Schnauzer — 20