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Relevance of stimuli used in canine behavioural testing with regards to proximal causality of dog bites

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01 | Background

❧ An increasing amount of attention is paid to medical, social and economical implications of dog bite accidents (Overall & Love 2001, Morgan & Palmer 2008).

❧ Decades of experience are available on aptitude tests, aimed at selecting suitable working and breeding dogs (Wilsson 1997, Ruefenacht 2002).

❧ More recently, existing as well as newly created subtests are combined in an effort to gauge canine aggression, fear and sociability. One of the main goals for such behaviour and temperament tests is to help predict, and therefore prevent, pet dog aggression incidents with human victims (Netto & Planta 1997, Lucidi et al. 2005).

02 | Aim

To investigate (1) which causal factors are known to elicit dog bites in humans, and (2) which of these are presented as stimuli in dog behaviour tests.

03 | Methodology

A literature search of studies published from 1991 to 2008 was conducted via ISI Web of Knowledge[SM] using the following key words: dog aggression, dog bite, behaviour test.

04 | Results

A. Dog bite accident (DBA) publications

❧ 245 references, 79 were considered following incorporation criteria.
❧ Surveyed years ranged from 1979 to 2005.

⬇ Table 1: Demographics of victims, relationship with aggressor and circumstances of attack reported in research papers and case reports published between 1991-2008.

	Research papers (n=50, 46,374 victims)		Case reports (n=29, 77 victims)	
	# papers	Results	# reports	Results
Gender	37	➜ 81 % reported a minimum of 50 % male victims	29	➜ 61 % male victims
Proportion of child victims	34	➜ 17 all-children and 3 all-adult studies ➜ Mixed studies: 13-70 % children, but variable age ranges	29	➜ 70 % child victims (54 cases) ➜ There were no child victims > 13 years
Familiarity	24	➜ 79 % reported a minimum of 50 % dog bite incidents in which the victim knew the dog ➜ Each all-child study for which this information was available (n=14) indicated the dog was familiar in > 50 % of cases	17	➜ Overall, victims knew the dog in 40 % of the cases (25 out of 63) ➜ Studies with child-only victims: 83 % of victims knew the attacking dog (25 out of 30) ➜ 87 % of victims (adult + child) who knew the dog were attacked in their own home
Proximal causation	12	➜ 9 of 12 papers discussing provocation of attacks, listed causes	4	➜ 2 of 4 reports discussing provocation of attacks, listed causes

B. Canine behaviour tests (CBT)

❧ 34 references, 8 were retained following incorporation criteria.

Causal factor	Occurrence in DBA	Occurrence in CBT
Play with dog	8	4
Pet	6	3[(*)]/4[(**)]
Remove food / bone / toy	5	3
Disturb eating dog	3	1
Child approaches	2	4[(***)]
Scold / shout	2	2
Hit threat	1	2
Push dog on back	1	3
Stare	1	3
Manipulating paws	1	1
Tresspass property	1	1

⬅ Table 2: Occurrence of stimuli, considered causal factors in DBA (max. = 9), used in novel CBT (max. = 7). Novel means containing at least one new subtest.

(*) human hand
(**) artificial hand/doll
(***) doll

⬇ Table 3: Causal factors (not used in CBT) and occurrence in DBA (max. = 9)

Causal factor	Occurrence in DBA	Causal factor	Occurrence in DBA
Interfere during dog fight	6	Lift	2
Hug / cuddle	4	Push dog off furniture	2
Brush / groom	3	Restrain by collar / scruff	2
Disturb while sleeping	3	Step / fall on dog	2
Pull on leash	3	Trim nails	2
Pull tail / ear / hair	3	Approach resting dog	1
Run / walk / ride by	3	Lie beside recumbent dog	1
Bathe	2	Nudge on bed or couch	1
Hit	2	Provide first aid	1
Kiss	2	Tease dog with food (child)	1

05 | Discussion

❧ Very few DBA studies reported on proximal causality and we found only one that had it as main focus (Reisner et al. 2007).

❧ We found that some studies identifying aggression-provoking elements provided little detail about the sequence of events prior to an attack. Some of the items listed in table 3 could be interpreted as circumstances instead of proximal causes.

❧ Generally benign interactions such as playing and petting were reported most as aggression-eliciting. Existing CBT, describe subtests involving play invitation. However, in all but one study play interaction itself is not tested. Petting tests are rarely effectuated via human contact. Instead a doll or an artificial hand is used (Kroll 2004).

❧ A number of 'popular' (based on this review) aggression-evoking factors have, to our knowledge, not been implicated in CBT.

06 | Conclusion

From the dog bite prevention viewpoint, information on proximal causation of dog bites is invaluable, yet scarcely available. Future studies should attempt to collect as much information as possible, preferably soon after an incident. This information will also help to make reliable conclusions about the validity of current dog behaviour testing and its ability to predict which dogs are likely to bite.

References
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A complete list of references and incorporation criteria is available from the first author: Christel.Moons@UGent.be | Tel.: +32 9 264 78 09.

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