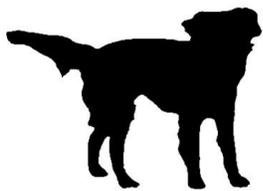


DOG COGNITION

Ethogram

Version

6 December 2018



Dog Cognition

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Ethogram

The below ethogram is presented using XML-syntax.

- if an element starts with capital letter or contains more than one words it should be written between ‘ and ’

Color: these elements are necessary/can be used

Color: example how the whole part of the text looks like in XML

Form of descriptions:

General layout of an XML file:

```
<transcript>
  <data>
    ...
  </data>

  <general_circumstances>
    ...
  </general_circumstances>

  <exercises>
    <exercise>
      ...
    </exercise>
    ...
    <exercise>
      ...
    </exercise>
  </exercises>
</transcript>
```

Data – part, data of the dog:

(has to be written only once for each dog, fill in according to the second picture of the film)

```
<data>
  <dog_number>12</dog_number>
  <name>'Tobias'</name>
  <breed>'Basset Artesienne Normand'</breed>
  <gender>male</gender>
  <age years="0" months="5"/>
  <castration>no</castration>
  <training>puppy</training>
  <training>'young dogs'</training>
  <training arg1="iib">roedelmethode</training>
</data>
```

training: none, puppy, ‘A’, ‘B’, ‘C’, ‘Club GG’, ‘GG I’, ‘GG II’, ‘GG III’, ‘young dogs’, beginner, basic, agility, ‘follow up’, ‘obedience’, ‘KCA’, ‘KVA’, ‘KNJV’, clicker, herding, tracking, **roedelmethode***

```
<training>'young dogs'</training>
```

Example in case of **roedelmethode:**

```
<training arg1="iib">roedelmethode</training>
```

levels: i, iia, iib, iii, iv, va, vb, vc

General circumstances - part:

```
<general_circumstances>
```

```

<date year="2004" month="01" day="16"/>
<area>'dog school'</area>
<surface>stone</surface>
<weather>
  <temperature>around_0</temperature>
  <wind_force>hard</wind_force>
  <wind_direction>changing</wind_direction>
  <sun>none</sun>
  <precipitation>none</precipitation>
</weather>
<disturbing_object>wood</disturbing_object>
</general_circumstances>

```

area: the layout of the given area, described in some words for instance about buildings, whether there is training going on, the openness of the area etc. written between ' . '.

```
<area>'dog school'</area>
```

surface: grass, sand, stone, stony, snow

```
<surface>stone</surface>
```

temperature: freezing, around_0, between_0_and_10, more_than_10

```
<temperature>around_0</temperature>
```

wind_force : hard, soft, none

```
<wind_force>hard</wind_force>
```

wind_direction : changing, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

{ **definition:**

wind direction: the direction of the wind with respect to the axis of the experimental area.

direction: it is determined using the direction of the hour clock hand }

```
<wind_direction>5</wind_direction>
```

sun : none, intermittent, shining

```
<sun>none</sun>
```

precipitation : none, snow, hail, **rain***

```
<precipitation>snow</precipitation>
```

Example in case of **rain :**

```
<precipitation arg1="drizzle" >rain</precipitation>
```

rain: drizzle, hard, torrent

(optional) elements within <general_circumstances>:

```

<disturbing_object>...</disturbing_object>
<disturbing_noise>...</disturbing_noise>
<disturbing_smell>...</disturbing_smell>
<other_disturbance>...</other_disturbance>

```

Exercises- part:

```

<exercises>
  ...
  <exercise type="b" trial="1" index="iv">
    <times>
      <starts min="05" sec="47"/>
      <ends min="06" sec="34"/>
      <on cam="cam_I"/>
    </times>
    <times>
      <starts min="20" sec="45"/>
      <ends min="21" sec="32"/>
      <on cam="cam_II"/>
    </times>
    <comment>not_analysable</comment>
    <exercise_content>
      <sequential>
        <parallel>
          <atomic>...</atomic>
          <atomic>...</atomic>
          <atomic>...</atomic>
        </parallel>
        <atomic arg1="general_reaction" arg2="4">total_number_of_behaviour</atomic>
      </sequential>
    </exercise_content>
  </exercise>

  <exercise type="b" trial="1" index="v">
    <times>
      <starts min="06" sec="34"/>
      <ends min="07" sec="30"/>
      <on cam="cam_I"/>
    </times>
    <times>
      <starts min="21" sec="32"/>
      <ends min="22" sec="28"/>
      <on cam="cam_II"/>
    </times>
    <exercise_content>
      <sequential>
        <atomic>...</atomic>
        <atomic arg1="general_reaction" arg2="4">total_number_of_behaviour</atomic>
      </sequential>
    </exercise_content>
  </exercise>

  <exercise type="b" trial="1" index="vi">
    <times>
      <starts min="07" sec="30"/>
      <ends min="08" sec="30"/>
      <on cam="cam_I"/>
    </times>
    <times>
      <starts min="22" sec="28"/>
      <ends min="23" sec="28"/>
    </times>
  </exercise>

```

```

        <on cam="cam_II"/>
    </times>
    <exercise_content>
        <sequential>
            <atomic>...</atomic>
            <parallel>
                <atomic>...</atomic>
                <atomic>...</atomic>
                <atomic>...</atomic>
            </parallel>
            <atomic>...</atomic>
            <atomic>...</atomic>
            <atomic arg1="general_reaction" arg2="4">total_number_of_behaviour</atomic>
        </sequential>
    </exercise_content>
</exercise>

<exercise type="b" trial="1 index="vii">
    <comment>not_on_tape</comment>
</exercise>
...
</exercises>

```

exercise

```
<exercise type="b" trial="1 index="vii">
```

type: a, b, c, d, e**trial:** 1, 2, 3, 4**index:** i, ii, iii, iv, v, vi, vii or: rr1, rr2, rl1, rl2, ll1, ll2, lr1, lr2**(optional) elements within <exercise>:****time:****{ definition:**

exercise starts, ends: it should be noted for all parts of each trial of each exercise (from ‘A 1 i’ till ‘E 1 vi’). The ‘start time’ denotes the very first moment of the exercise taped, ‘end time’ denotes the last moment of it, as recorded by camera I or II. Timing data per exercise might be given twice: both for cam_I and for cam_II (only if there exist both of them)}

comment:

```

<comment>not_analysable</comment>
<comment>not_on_tape</comment>
<comment>not_performed</comment>
<comment>'other comments, if needed'</comment>

```

Within the <exercise_content> part, arbitrary nesting of <sequential>, <parallel> and <atomic> actions is allowed.

The below <atomic> ...</atomic> elements can be used within <exercise> </exercise> elements as already shown.

Disturbances that occur during certain exercises:

```

<atomic arg1="wood">disturbing_object</atomic>
<atomic arg1="mobile_phone">disturbing_noise</atomic>
<atomic arg1="urine_of_other_dog">disturbing_smell</atomic>
<atomic arg1="starts_snowing">other_disturbance</atomic>

```

wind has changed into direction

<atomic arg1="12">wind_has_changed</atomic>
arguments: 1,2,3,4,5,6,7,8,9,10,11,12

total number of behaviour

<atomic arg1="general_reaction" arg2="4">total_number_of_behaviour</atomic>
arguments: 1,2,3,4,5,6,7,8,9,10,11,12, 13, 14, 15, 16, 17, 18, 19, 20

The total_number_of_behaviour, gives the total number of reactions of the dog within one step of the handler for each trail.

Body posture of the dog:**dog torso direction**

<atomic arg1="5">dog_torso_direction</atomic>
arguments: 1, 2, 3, 4, 5, 6,7,8,9,10,11,12

{ definitions:

dog torso direction: direction of shoulders with respect to handler, see Appendix IV }

dog general posture

<atomic arg1="high">dog_general_posture</atomic>
arguments: low, neutral, high, resistant

{ definitions:

dog general posture: a general description about the whole posture of the dog while standing, walking and sitting. This description refers to the total image of the dog's posture. Using it the detailed descriptions about head stance, ear stance and tail stance are also meant to hold.

low: the shoulders and the rear of the body are low, the head is a bit lifted, the tail might be tucked in between the rear legs, the whole body is more down than in relaxed state.

neutral: the head, ears, tail and the whole torso are in relaxed state, there is no special muscle tension.

high: the shoulders, head, tail, and rear of the body are higher than in relaxed state, there is visible muscle tension that is needed for this posture.

resistant: the forepaws and the back paws stand in front of the torso, to the forward, the whole body stiffens, there is visible muscle tension. }

dog body posture

<atomic arg1="high">dog_body_posture</atomic>
arguments: low, neutral, high, resistant

{ definitions:

dog body posture: a general description about the body posture of the dog while standing, walking and sitting. If 'dog body posture' is used, also a detailed description about head stance, tail stance and ear stance should be given.

low: the shoulders and the rear of the body are lower than in relaxed state.

neutral: the torso are in relaxed state, there is no special muscle tension.

high: the shoulders, and the rear of the body are higher than in relaxed state, there is visible muscle tension that is needed for this posture.

resistant: all paws are at the same slanted angle with respect to the ground, the whole body stiffens, there is visible muscle tension. }

About front paws of the dog:**dog paw front**`<atomic arg1="left">dog_paw_front</atomic>`

arguments: left, right, level

{definition:

dog paw front: this element is used when the dog sits or stands to denote the stance of the paws. It describes which paw is more in front with respect to the torso direction, the front left paw or the front right paw. If the front paws are exactly next to each other *level* is used. }

dog front paw bent`<atomic arg1="left">dog_front_paw_bent</atomic>`

arguments: left, right

dog moves paw`<atomic arg1="left" arg2="backward">dog_moves_paw </atomic>`

arguments1: left, right, rear

arguments2: backward, forward

{definition:

dog moves paw: the dog moves or steps with its right or left front paw backward or forward. }

dog lifts paw`<atomic arg1="left">dog_lifts_paw</atomic>`

arguments: left, right

dog replaces paw:`<atomic arg1="left">dog_replaces_paw</atomic>`

arguments1: left, right

{definition:

replaces paw: the dog first has its paw lifted then it places it back on the ground at approximately the same place as it was before. }

About the head and ear stance of the dog:**dog head posture**`<atomic arg1="high">dog_head_posture</atomic>`

arguments: low, neutral, high

{definitions:

dog head posture: the head posture of the dog in the vertical plane. See pictures (appendix I.)

low: the dog holds its head more down, more between the shoulders

neutral: the dog holds its head as in relaxed state

high: the dog holds its head higher than in relaxed state }

dog head tilt`<atomic arg1="up">dog_head_tilt</atomic>`

arguments: up, down, level, tilted, very_high

{definition:

dog head tilt: how the dog holds its head in the horizontal plane. }

The form and the natural stance of ears depend on the breed of the dog. The main points can be fixed by the followings:

dog ear stance`<atomic arg1="neutral">dog_ear_stance</atomic>``<atomic arg1="left" arg2="neutral">dog_ear_stance</atomic>`

(optional) arguments1: left, right

arguments2: neutral, backward, forward

{ definitions:

ear stance: the dog may move its ears either independently from each other or together. If both ears have the same stance then the first argument should be left out- see first example.

forward: the ears are more forward than in relaxed state, there is a visible muscle tension that causes this. The face typically looks a bit shorter.

neutral: the ears of the dog are just as in relaxed state of the dog, there is no special muscle tension.

backward: the ears are held backward, this requires visible muscle tension as well. The face typically seems to be elongated a bit..}

dog moves ear

<atomic arg1="left">dog_moves_ear</atomic>

<atomic arg1="right" arg2="backward">dog_moves_ear</atomic>

arguments1: left, right

(optional) arguments2: neutral, backward, forward

{ remark:

when using it the result of this movement in the ear stance of the dog should also be mentioned using dog_ear_stance or dog_general_posture }

dog ear orientation

<atomic arg1="left" arg2="towards_handler">dog_ear_orientation</atomic>

<atomic arg1="right" arg2="12">dog_ear_orientation</atomic>

argument1:left, right

argument2: **place**

(optional) arguments2: 1,2,3,4,5,6,7,8,9,10,11,12

{ definition:

ear orientation: The dog might have its ears orientated in a certain direction. For example towards the handler.

note: Only used in transcripts younger than 6/12/2018.

Dog looks and turns towards objects:**dog looks**

<atomic arg1="towards_handler">dog_looks</atomic>

<atomic arg1="12">dog_looks</atomic>

<atomic arg1="mat">dog_looks</atomic>

{ definition:

looks: where the dog looks with its eyes, can be relative with respect to handler or axis of the experimental area, see Appendix IV. }

argument1: **place**

(optional) arguments2: 1,2,3,4,5,6,7,8,9,10,11,12

{ definitions:place:

individual: handler, dog, experimenter, cameraman1, cameraman2, towards_experimenter, towards_handler, away_from_handler, up_to_handler, at_handlers_hand, at_experimenter's_hand, at_handlers_leg, at_experimenter's_leg, handlers_face, handlers_hand, experimenter's_hand,

object: at_surroundings, at_ground, down, alley, ground, mat, puddle, goody, barrel, thing, handler_goody, wooden_board, flag, pylon

direction: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

pylon: middle_pylon, left_pylon, right_pylon, goody_pylon, flag, start_pylon, starting_point

handler goody: this expression indicates goodies offered by the handler to the dog. Handlers usually use goody to get the dog to sit.

flag: A flag which indicates the start position. This flag is sometimes exchanged for a pylon. The words flag, start_pylon and starting_point are all used to indicate the start position. Starting_point is preferred.

start_pylon: A pylon which indicates the start position. This pylon is sometimes exchanged for a flag. The words flag, start_pylon and starting_point are all used to indicate the start position. Starting_point is preferred.

thing: a not specified object. The specification must be added in a comment: <comment>'...'/</comment>.

arguments2: The numbering can be used in combination with 'pylon', to indicate a pylon in the alley. See appendix III.}

dog looks at pylon

<atomic arg1="right">dog_looks_at_pylon</atomic>

arguments: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, middle, left, right, goody_pylon, start_pylon, flag

{ **definitions:**

goody pylon, middle, left, right pylons: this denomination is used for the pylon under which the goody is currently hidden (one of middle, left and right). If the dog is looking at a pylon under which there is no goody at that time then we use 'middle', 'left', 'right' or the number of the pylon in the alley. For the alley numbering see appendix III. }

dog looks inside pylon

<atomic arg1="6">dog_looks_inside_pylon</atomic>

arguments: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, middle, left, right, goody_pylon, start_pylon

dog looks at handler's leg

<atomic arg1="right">dog_looks_at_handlers_leg</atomic>

<atomic>dog_looks_at_handlers_leg</atomic>

(optional) argument: left, right

dog head pointed

<atomic arg1="12">dog_head_pointed</atomic>

arguments: **place**

(optional) arguments2: 1,2,3,4,5,6,7,8,9,10,11,12

{ **definition:**

If not a specific place, then it refers to the direction, relative to the handler, in which the dog's head is pointed, see Appendix IV. }

dog turns head

<atomic arg1="12">dog_turns_head</atomic>

arguments: **place**

{ **definition:**

turns head: where the dog turns its head. Might be relative to the handler, see Appendix IV. }

dog turns

<atomic arg1="towards_handler">dog_turns</atomic>

arguments: **place**

{ **definition:**

dog turns: the dog turns towards '<place>' by moving its whole body for facing it. Might be relative to handler, see Appendix IV. }

About the tail stance and tail activity of the dog:

The form and the natural stance of ears depend on the breed of the dog. The main points can be fixed by the followings:

dog tail direction (horizontally)

<atomic arg1="left">dog_tail_direction</atomic>

arguments: left, right, middle, 1,2,3,4,5,6,7,8,9,10,11,12

{ **definition:**

Where the dog tail is pointing. Might be relative to the handler, see Appendix IV. }

dog tail stance (vertical)

<atomic arg1="high">dog_tail_stance</atomic>

arguments: low, neutral, high, very_high, tucked_in

{ **definitions:**

dog tail stance: how the dog holds its tail vertically. .

low: the dog holds its tail lower than when it is in a relaxed state

neutral: the tail of the dog is held as in its relaxed state

high: the dog holds its tail higher than when it is relaxed

very high: the tail is held especially high according to the neutral tail stance

tucked in: the tail is tucked in between the rear legs of the dog while covering the genitals}

dog tail activity

<atomic arg1="some">dog_tail_activity</atomic>

arguments: none, some, frequent

{ definitions:

none: no tail activity at all

some: tail changes stance less than 3 times in this trial

frequent: tail changes stance more than 2 times in this trial}

{ remark:

this element gives a general description about the tail activity of the dog during the whole trial. That's why it should only be mentioned once, at the beginning of the trial. }

dog wags tail

<atomic arg1="slightly">dog_wags_tail</atomic>

(optional) arguments1: none, slightly, hard

{ definitions:

slightly: tail wags less than 14 times per 30 seconds

hard: tail wags more than 13 times per 30 seconds }

changed since December 2007

About leash and tension on leash:

pulls leash

<atomic arg1="handler">pulls_leash</atomic>

<atomic arg1="handler" arg2="some" arg3="slightly">pulls_leash</atomic>

<atomic arg1="dog" arg3="hard">pulls_leash</atomic>

arguments1: handler, dog, experimenter, cameraman1, cameraman2

(optional) arguments2: none, some, frequent

(optional) arguments3: slightly, hard

{ definitions:

none: no tension on the leash at all

some: leash tension is visible, but is not more frequent than in every 9th step

frequent: leash tension is visible more frequent than in every 9th step

slightly: the one who is pulling the leash doesn't really have an effect on the individual at the other end of the leash

hard: the one who is pulling the leash has a clearly visible effect on the other individuals body}

handler pulls dog

<atomic>handler_pulls_dog</atomic>

{ definition:

handler pulls dog: the handler gives a pull on the leash and pulls the dog closer to himself}

Handler's and experimenter's activity - in connection with the dog:

handler talks to dog

<atomic>handler_talks_to_dog</atomic>

handler gives goody to dog

<atomic>handler_gives_goody_to_dog</atomic>

handler offers goody to dog`<atomic>handler_offers_goody_to_dog</atomic>`handler pets dog`<atomic>handler_pets_dog</atomic>`handler bends over dog`<atomic>handler_bends_over_dog</atomic>`handler pushes dog down`<atomic>handler_pushes_dog_down</atomic>`**{ definition:**

pushes down: the handler forces the dog to sit by pushing down its rear. }

handler holds dog between his legs`<atomic>handler_holds_dog_between_legs</atomic>`handler hand food pose`<atomic>handler_hand_food_pose</atomic>`**{ definition:**

hand in holding position: we use this when the handler gets the dog to do things by holding his hand as if hiding a goody in it }

hand goes to dog's nose`<atomic>hand_goes_to_nose</atomic>`**{ definition:**

hand goes to nose: the handler gets the dog to sit or gets it to turn around or change its place by holding his hand to the dog's nose as if holding a goody. Handlers usually do this when they want the dog to sit to another place than it has sat before. }

individual commands`<atomic arg1="handler" arg2="sit">commands</atomic>`

arguments1: handler, dog, experimenter, cameraman1, cameraman2

arguments2: sit, here, stay, search, search forward, down, follow, free, no, fffffff, ttttt, whistles, stamps_feet, claps

{ definition:

commands: these commands can be heard in Dutch on the tapes. The corresponding words in Dutch are: Zit | Kom | Blijf | Zoek | Vooruit zoek | Af | Volg | Vrij }

handler lets the dog take off`<atomic>handler_lets_dog_take_off</atomic>`**{ definition:**

handler lets the dog take off: this is used in exercises C, D and E, at the moment that the handler releases the dog (i.e. the dog is free to go). This does not necessarily mean that the handler gives any command. }

experimenter talks to dog`<atomic>experimenter_talks_to_dog</atomic>`**experimenter offers goody to dog's nose**`<atomic>experimenter_offers_goody_to_dogs_nose</atomic>`**{ definition:**

experimenter offers goody to dog's nose: this is used in the beginning of exercises C, D and E, when the handler covers the dog's eyes (or stands next to it in exercise E) and the experimenter goes to the dog and gets it to smell the goody. }

experimenter gives goody to dog`<atomic>experimenter_gives_goody_to_dog</atomic>`

Dog's or other persons' movements for initiating acts or for approaching things:**individual initiates movement**

<atomic arg1="handler">individual_initiates_movement</atomic>
 arguments1: handler, dog, experimenter, cameraman1, cameraman2
 arguments2: left, right

{definition:

Initiates movement: to indicate that the individual is initiating a movement with a leg by lifting a leg, but is not continuing the movement.
 argument2: foot or paw used to initiate movement.
note: argument2 only used in transcripts younger than 6/12/2018
 }

individual replaces foot

<atomic arg1="handler" arg2="left">individual_replaces_foot</atomic>
 arguments1: handler, experimenter, cameraman1, cameraman2
 arguments2: left, right

{remark:

we only use this for persons, for the dog we have 'dog_replaces_paw' separately.}

individual lifts foot

<atomic arg1="handler" arg2="left">individual_lifts_foot</atomic>
 arguments1: handler, experimenter, cameraman1, cameraman2
 arguments2: left, right

{remark:

we only use this for persons, for the dog we have dog_replaces_paw separately.}

dog moves to 'direction' 'in speed'

<atomic arg1="12" arg2="gallop" arg3="left">dog_moves_to</atomic>
 arguments1: 1,2,3,4,5,6,7,8,9,10,11,12
 (optional) arguments2: walk, trot, gallop, irregular
 (optional) arguments3: left, right

{definitions:

dog moves to: this element is mainly used to denote the speed of the dog while moving. When the dog moves towards a certain object then individual_goes_to or individual_goes_towards should also be used.
walk: a 4-time gait, the order of the paws: left front, right rear, right front, left rear. This gait is slower than trot and gallop, a kind of relaxed speed of the dog.
trot: a 2-time gait, the order of the paws: right front + left rear, left front + right rear. This gait is faster than walk but slower than gallop.
gallop: a 4-time gait, in two variations: the left gallop and the right gallop (see 'left' and 'right' below) . This is the fastest of the gaits. For more information see appendix III.
left: a gallop with this order of paws: right front, left front, right rear, left rear
right: a gallop with this order of paws: left front, right front, left rear, right rear
irregular: there is no regular rhythm in the movements of paws, this can cause changeability in speed as well. }

individual goes towards

<atomic arg1="handler" arg2="mat">goes_towards</atomic>

{definition: This movement means the individual is moving in the direction of something, but is not getting there. }

arguments1: handler, dog, experimenter, cameraman1, cameraman2
 argument2: **place**
 (optional) arguments3: 1,2,3,4,5,6,7,8,9,10,11,12

{definition:

arguments3: The numbering can be used in combination with ‘pylon’, to indicate a pylon in the alley. See appendix II }

individual turns around:

<atomic arg1="dog" arg2="flag">turns_around</atomic>

arguments1: handler, dog, experimenter, cameraman1, cameraman2

argument2: **place**

(optional) arguments3: 1,2,3,4,5,6,7,8,9,10,11,12

{ **definition:**

arguments3: The numbering can be used in combination with ‘pylon’, to indicate a pylon in the alley. See appendix II. }

individual goes to

<atomic arg1="dog" arg2="experimenter">goes_to</atomic>

{definition: This movement means the individual is moving to something and is actually getting there.

arguments1: handler, dog, experimenter, cameraman1, cameraman2

argument2: **place**

(optional) arguments3: 1,2,3,4,5,6,7,8,9,10,11,12

{ **definition:**

arguments3: The numbering can be used in combination with ‘pylon’, to indicate a pylon in the alley. See appendix II. }

individual passes

<atomic arg1="dog" arg2="handler">passes</atomic>

arguments1: handler, dog, experimenter, cameraman1, cameraman2

argument2: **place**

(optional) arguments3: 1,2,3,4,5,6,7,8,9,10,11,12

{ **definition:**

arguments3: The numbering can be used in combination with ‘pylon’, to indicate a pylon in the alley. See appendix II. }

individual goes towards pylon

<atomic arg1="handler" arg2="goody_pylon">goes_towards_pylon</atomic>

arguments1: handler, dog, experimenter, cameraman1, cameraman2

arguments2: middle, left, right, goody_pylon, start_pylon, 1,2,3,4,5,6,7,8,9,10,11,12

{ **definition:** This movement means the individual is moving in the direction of a pylon, but is not getting there. }

individual turns around pylon

<atomic arg1="handler" arg2="6">turns_around_pylon</atomic>

arguments1: handler, dog, experimenter, cameraman1, cameraman2

arguments2: middle, left, right, goody_pylon, start_pylon, 1,2,3,4,5,6,7,8,9,10,11,12

individual goes to pylon

<atomic arg1="dog" arg2="left">goes_to_pylon</atomic>

arguments1: handler, dog, experimenter, cameraman1, cameraman2

arguments2: middle, left, right, goody_pylon, start_pylon, 1,2,3,4,5,6,7,8,9,10,11,12

{ **definition:** This movement means the individual is moving to the pylon and is actually getting there.

individual passes pylon

```
<atomic arg1="dog" arg2="goody_pylon">passes_pylon</atomic>  
arguments1: handler, dog, experimenter, cameraman1, cameraman2  
arguments2: middle, left, right, goody_pylon, start_pylon, 1,2,3,4,5,6,7,8,9,10,11,12
```

handler walks`<atomic>handler_walks</atomic>``<atomic arg1="12">handler_walks</atomic>`

(optional) arguments: 1,2,3,4,5,6,7,8,9,10,11,12

{ remark:

we only note the experimenter's walk and walking direction when it has an influence on the behaviour of the dog and thus it is important to know }

experimenter walks`<atomic arg1="12">experimenter_walks</atomic>`

(optional) arguments: 1,2,3,4,5,6,7,8,9,10,11,12

{ remark:

we only note the experimenter's walk and walking direction when it has an influence on the behaviour of the dog and thus it is important to know }

Handler's and experimenter's activity:**handler steps**`<atomic arg1="left" arg2="backward">handler_steps_with</atomic>`

arguments1: left, right

arguments2: backward, forward

{ definition:

handler_steps_with: this element denotes the moment when the handler starts a visible movement of shift in weight in preparation of lifting a heel or, if weight shifting is been done and more that 5 frames no movement have been noticed (1 frame is 0,08 second), lifts his left or right heel of the foot from the ground when stepping. **1 step:** From the moment of the weight displacement, often together with a knee movement, until the heel of the second foot is lifted (note the front of the shoe is still touching the ground). }

handler stops walking`<atomic>handler_stops_walking</atomic>`**{ definition:**

handler_stops_walking: this element denotes the moment when the handler stops; handler_steps_with. The handler has not lift its second heel jet. }

handler turns around`<atomic arg1="left" >handler_turns_around</atomic>`

arguments1: left, right

{ definition:

turns around: the handler turns back either to the left or to the right }

points towards`<atomic arg1="handler" arg2="12">points_towards</atomic>``<atomic arg1="handler" arg2="goody_pylon">points_towards_pylon</atomic>`

arguments1: handler, dog, experimenter, cameraman1, cameraman2

arguments2: **place**

(optional) arguments3: 1,2,3,4,5,6,7,8,9,10,11,12

{ definition:

arguments3: The numbering can be used in combination with 'pylon', to indicate a pylon in the alley. See appendix II. }

individual ends trial`<atomic arg1="experimenter">individual_ends_trial</atomic>`

arguments1: handler, dog, experimenter, cameraman1, cameraman2

{ definition:

ends_trial: if the experimenter or the handler decides so during exercises C, D and E that it is time to finish that trial. This happens for example when the handler thinks that the dog already knows where the goody is but it is still searching. Handlers use terminating as a kind of punishment in this case. }

experimenter places goody on the ground

<atomic>experimenter_places_goody_on_ground</atomic>

{**definition:**

places goody on ground: to denote when the experimenter places the goody on the ground in exercise E. }

Position of the dog, ‘basic movements’:

dog position

<atomic arg1="12" arg2="1">dog_position</atomic>

arguments1: 1,2,3,4,5,6,7,8,9,10,11,12

arguments2: 0, 0.5, 1, more_than_one {these values are meant in meters: 0 meter, more than 1 meter etc. }

{**definitions:**

dog position: position of the dog with respect to the handler while sitting, lying or walking. If there is a change in the position it should be noted each case.

direction: from the perspective of the handler. }

dog sits

<atomic>dog_sits</atomic>

<atomic arg1="actively">dog_sits</atomic>

(optional) arguments: actively, relaxed

{**definitions:**

active sitting: the dog sits, with its rear paws under its torso. The dog is ready to move from this position immediately if needed.

relaxed sitting: the dog sits with its rear paws not right under its torso, but a bit to the side. This type of sitting is more comfortable for the dog but it needs to move its back paws under its torso before it can move off.

over active sitting: the dog sits with its rear paws under its torso, while the bottom of the dog is just not touching the ground. The dog is ready to move from this position immediately if needed. }

dog lies

<atomic>dog_lies</atomic>

<atomic arg1="actively">dog_lies</atomic>

(optional) arguments: actively, relaxed, over_active, frog

{**definitions:**

actively: the dog lies in such a posture that allows it to move away immediately if needed, i.e., its rear paws are all under its body, its front paws are straight ahead of its body.

relaxed: at least one of its rear paws is not under its torso, so one hip is closer to the ground than the other or the dog is on its back. This stance requires more effort from the dog if it has to move away.

over active: the dog lies in such a posture that allows it to move away immediately if needed, i.e., its rear paw are all under its body, its front paws are straight ahead of its body, while the torso is just not touching the ground.

frog: the dog lies flat on the ground with the rear paws stretched backwards. The hips are widened and flat. This stance requires more effort from the dog if it has to move away. }

dog stands up

<atomic>dog_stands_up</atomic>

dog stands

<atomic>dog_stands</atomic>

dog stiffens`<atomic>dog_stiffens</atomic>`**{definition:**

stiffens: the dog doesn't move, there is visible muscle tension in its limbs and whole body. Its head is pointed towards something. }

Dog's activity before searching and during searching:**dog licks nose**`<atomic>dog_licks_nose</atomic>`**{definition:**

licks nose: the dog licks the top of its nose in a clearly visible way. It does this to activate its taste buds. }

dog licks 'object'`<atomic arg1="handlers_hand">dog_licks</atomic>`

arguments: ground, flag, mat, puddle, goody, barrel, handlers_face, handlers_hand, experimenters_hand, thing, handler_goody, wooden_board

dog sniffs 'place'`<atomic>dog_sniffs</atomic>``<atomic arg1="12">dog_sniffs</atomic>`

(optional) arguments: **place**

dog sniffs at pylon`<atomic arg1="start_pylon">dog_sniffs_at_pylon</atomic>`

arguments1: **place**

arguments2: 1,2,3,4,5,6,7,8,9,10,11,12

{definition:

arguments3: The numbering can be used in combination with 'pylon', to indicate a pylon in the alley. See appendix II. }

dog searches`<atomic>dog_searches</atomic>`**{definition:**

searches: the dog is twitching its nose, its head is moving side to side while sniffing }

Dog's activity in connection with other persons and objects:**dog jumps up to**`<atomic arg1="experimenter">dog_jumps_up_to</atomic>``<atomic arg1="wooden_board">dog_jumps_up_to</atomic>`

arguments: handler, dog, experimenter, cameraman1, cameraman2, **place**

{definition:

jumps up: the dog jumps up to a person (or other places) and leans against him with its front paws. }

dog pushes over handler`<atomic>dog_pushes_over_handler</atomic>`**{definition:**

pushes over handler: the dog resists sitting or blindfold so much that while resisting and trying to get out of the handler's hands it also pushes over the handler. }

dog marks`<atomic arg1="mat" arg2="urine">dog_marks</atomic>`arguments1: **place**

arguments2: urine, defecation, paw, body, tongue

(optional) arguments2: 1,2,3,4,5,6,7,8,9,10,11,12

{definition:

dog marks: this element denotes kinds of ways how the dog can mark objects in its environment: urinating, touching objects, persons with its paws, licking persons, objects. This includes only passive actions. Nothing that includes teeth.

arguments3: The numbering can be used in combination with 'pylon', to indicate a pylon in the alley. See appendix II }

dog snaps`<atomic arg1="flag">dog_snaps</atomic>`

arguments1: flag, mat, goody, barrel, handlers_face, handlers_hand, experimenters_hand, thing, handler_goody, wooden_board

{definition:

dog snaps: this element denotes kinds of ways the dog can mark objects in its environment with its teeth. }

dog synchronises steps`<atomic>dog_synchronises</atomic>`**{definition:**

synchronise: the dog synchronises its speed and its steps with the handler: if the handler steps with his left, the dog will also step with its left front paw, if he steps with its right, the dog will also step with its right front paw. }

dog follows`<atomic>dog_follows</atomic>`**{definition:**

follows: 'dog position 7' with respect to the handler, within 0.5 meter from him, the dog's nose is pointed at 2 and the dog synchronises its movements with those of the handler. }

Dog's activity that are considered as stress signals:**dog hesitates**`<atomic>dog_hesitates</atomic>`**{definition:**

hesitates: the dog initiates a movement, after that it slows down or speeds up and makes a decision whether to move or to stay. }

dog twitches paw`<atomic arg1="left">dog_twitches_paw</atomic>`

arguments: left, right

{definition:

twitches paw: some of the muscles are vibrating, it is typically visible in twitching of the front paw. }

dog flicks tongue`<atomic>dog_flicks_tongue</atomic>`**{definition:**

flicks tongue: the dog tries to make its mouth wet by flicking its tongue. }

dog sneezes`<atomic>dog_sneezes</atomic>`

dog yawns`<atomic>dog_yawns</atomic>`**dog shakes body**`<atomic>dog_shakes_body</atomic>`**dog scratches**`<atomic>dog_scrathces</atomic>`**dog shivers**`<atomic>dog_shivers</atomic>`**dog coughs**`<atomic>dog_coughs</atomic>`**About blindfolding and the dog's resistance against blindfold or sitting:**dog's eyes are covered`<atomic arg1="cover">dogs_eyes_covered</atomic>`

arguments: cover, shield, handlers_hands

{definition:

to blindfold the dog in exercise C and D we use either paper towel, the handler's hands, or a wooden board. In this notation 'cover' is for the case when we use the paper towel, 'shield' is used when we use the board to blindfold the dog. }

dog resists against`<atomic arg1="sitting">dog_resists</atomic>`

arguments: sitting, blindfold, handler, pulling

{definition:handler: In this notation 'handler' is for the case when the dog resists being hold by the handler.pulling: When the dog resists being pulled by the leash. }**Dog's or other persons' activity in connection with pylons:**experimenter puts goody under pylon`<atomic arg1="middle">experimenter_puts_goody_under_pylon</atomic>`

arguments: middle, left, right, goody_pylon, start_pylon, 1,2,3,4,5,6,7,8,9,10,11,12

{definition:

experimenter puts goody under pylon: is only noted in those cases when the experimenter does not put the goody under the proper pylon in certain trials (exercise C1:middle pylon, exercise C2: left pylon, exercise C3: under the right pylon). }

pylon is replaced`<atomic>pylon_is_replaced</atomic>`**pushes over pylon**`<atomic arg1="leash" arg2="5">pushes_over_pylon</atomic>``<atomic arg1="experimenter" arg2="5" arg3="hand">pushes_over_pylon_with</atomic>`

arguments1: leash, handler, dog, experimenter, cameraman1, cameraman2

arguments2: middle, left, right, goody_pylon, start_pylon, 1,2,3,4,5,6,7,8,9,10,11,12

(optional) arguments3: head, paw, hand

[arguments: The numbering can be used to indicate a pylon in the alley. See appendix II }

Dog's or other persons' activity in connection with the alley:**individual's position from the alley**

<atomic arg1="handler" arg2="inside">position_from_alley</atomic>

arguments1: handler, dog, experimenter, cameraman1, cameraman2

arguments2: inside, left, right, starting_point

{definition:

position from the alley: the position of the handler or of the experimenter with respect to the alley- whether he is walking in the alley or he is on the left or on the right side of it. }

dog avoids alley

<atomic>dog_avoids_alley</atomic>

{definition

avoids: does not go into the alley at all, it avoids the alley totally. If the dog spends even some seconds in side of the alley then this element can't be used in that case. }

dog enters alley between

<atomic arg1="1" arg2="4">dog_enters_alley_between</atomic>

arguments: 1,2,3,4,5,6,7,8,9,10,11,12

{ arguments: The numbering can be used to indicate a pylon in the alley. See appendix II }

dog leaves alley between

<atomic arg1="1" arg2="4">dog_leaves_alley_between</atomic>

arguments: 1,2,3,4,5,6,7,8,9,10,11,12

{ arguments: The numbering can be used to indicate a pylon in the alley. See appendix II }

dog stands between pylons

<atomic arg1="3" arg2="5">dog_stands_between_pylons</atomic>

arguments: 1,2,3,4,5,6,7,8,9,10,11,12

{definition

stands between: the dog doesn't enter the alley, it just stands between two pylons- either entering the alley or moving to the side of it in the following some seconds.

arguments: The numbering can be used to indicate a pylon in the alley. See appendix II }

while walking through the alley, the dog sticks to the

<atomic arg1="right">dog_through_alley</atomic>

arguments: middle, left, right

{definition

dog through alley: this element is used only when the dog goes through the alley- entering between pylons number 1 and 2 and leaving between pylons number 11 and 12. When the dog only goes partially into the alley then this element can't be used. }

individual brings dog to

<atomic arg1="handler" arg2="starting_point">individual_brings_dog_to</atomic>

arguments1: handler, dog, experimenter, cameraman1, cameraman2

arguments2: **place**

(optional) arguments3: 1,2,3,4,5,6,7,8,9,10,11,12

{definition:

brings dog to: when the dog resists sitting or doesn't sit in the required position then the handler either lifts the dog and replaces it or pulls the dog to the starting point.

arguments3: The numbering can be used in combination with 'pylon', to indicate a pylon in the alley. See appendix II }

Dog's activity in connection with goody:dog tries for goody held by handler`<atomic>dog_tries_for_handler_goody</atomic>`dog tries for goody held by experimenter`<atomic>dog_tries_for_experimenter_goody</atomic>`**{definitions:**

usually happens when the experimenter gets the dog to smell the goody, in the beginning of exercises C, D or E. }

dog eats`<atomic arg1="goody">dog_eats </atomic>``<atomic arg1="thing">dog_eats </atomic>`

arguments: ground, flag, mat, goody, thing, handler_goody, wooden_board

dog takes`<atomic arg1="goody">dog_takes </atomic>`

arguments: ground, flag, mat, goody, thing, handler_goody, wooden_board

{definitions:takes goody: if the goody is the favourite ball or toy of the dog then good performance at searching exercises is finding and taking the goody. }**Miscellaneous category:****Dog's activity:****dog digs**`<atomic>dog_digs</atomic>`**dog makes snap at hand**`<atomic arg1="handler">dog_makes_snap_at_hand</atomic>`

arguments: handler, dog, experimenter, cameraman1, cameraman2

dog jumps back`<atomic>dog_jumps_back</atomic>`**{definition:**jumps back: when the dog jumps back as a reaction for the experimenter's act. }dog yelps`<atomic>dog_yelps</atomic>`dog bites leash`<atomic>dog_bites_leash</atomic>`**dog sees position of goody**`<atomic>dog_sees_position_of_goody</atomic>`**dog spits out goody**`<atomic>dog_spits_out_goody</atomic>`**dog drinks from puddle**`<atomic>dog_drinks_from_puddle</atomic>`

dog tilts pylon

<atomic arg1="5" arg2="paw">dog_tilts_pylon_with</atomic>
 arguments1: middle, left, right, goody_pylon, start_pylon, 1,2,3,4,5,6,7,8,9,10,11,12
 arguments2: head, paw

dog front paw turned outwards

<atomic arg1="left">dog_front_paw_turned_outwards</atomic>
 arguments: left, right, both
 {**definition:**
 Dog front paw turned outwards: the paw of the front leg of the dog is turned outwards more than is normal for that breed of dog (see appendix I). }

dog barks

<atomic>dog_barks</atomic>

dog jumps next to

<atomic arg1="handler">dog_jumps_next_to</atomic>
 arguments: **place**
 {**definition:**
 jumps up: the dog jumps up into the air next to a person (or other places). }

Handler's activity:handler unleashes dog

<atomic> handler_unleashes_dog</atomic>

handler steps over dog

<atomic arg1="left">handler_steps_over_dog_with</atomic>
 arguments: left, right

handler steps on dog

<atomic>handler_steps_on_dog</atomic>
 {**definition:**
 steps on dog: happens when the handler steps backward, doesn't see the dog and steps on it, not deliberately}

handler frees dogs leg of leash

<atomic>handler_frees_dogs_leg_of_leash</atomic>
 {**definition:**
 handler frees dogs leg of leash: happens when the legs of the dog are hindered by the leash and the handler ends this hindrance. }

handler holds dog head away from goody pylon

<atomic>handler_holds_dog_head_away_from_goody_pylon</atomic>

handler pushes dog into direction

<atomic arg1="12">handler_pushes_dog</atomic>
 arguments: 1,2,3,4,5,6,7,8,9,10,11,12

Parts of exercises:

Exercise A

A I: before sitting
A II: sitting
A III: taking off
A IV: walking on route
A V: walks back

Exercise B: B1, B2, B3

B1 I: before sitting
B1 II: sitting
B1 III: handler steps with right leg (and back)
B1 IV: before sitting
B1 V: sitting
B1 VI: handler steps with left leg (all the three steps and back)

Exercise B4

B1 I: before sitting
B1 II: sitting
B1 III: handler commands follow

Exercise C: C1, C2, C3

C1 I: before sitting
C1 II: sitting (eyes covered and then uncovered)
C1 III: before sitting
C1 IV: sitting
C1 V: taking off – the first step of the dog only (to note with which paw it has started)
C1 VI: searching

Exercise D: D1, D2, D3

D1 I: before sitting
D1 II: sitting (eyes covered and then uncovered)
D1 III: before sitting
D1 IV: sitting
D1 V: taking off– the first step of the dog only
D1 VI: searching

Exercise E

E I : before sitting
E II: sitting
E III: before sitting
E IV: sitting
E V: taking off– the first step of the dog only
E VI: searching

Appendix I Dog head posture, dog front paws turned outwards, dog tail stance vertical

Dog head posture

Head posture of the dog in the vertical plane

Low



Neutral



High



Dog front paw turned outwards

Front paws of the dog in normal stance



Front paw of the dog turned outwards

Left



Right



Both



Dog tail stance (vertical)

Neutral



Tucked in



Low



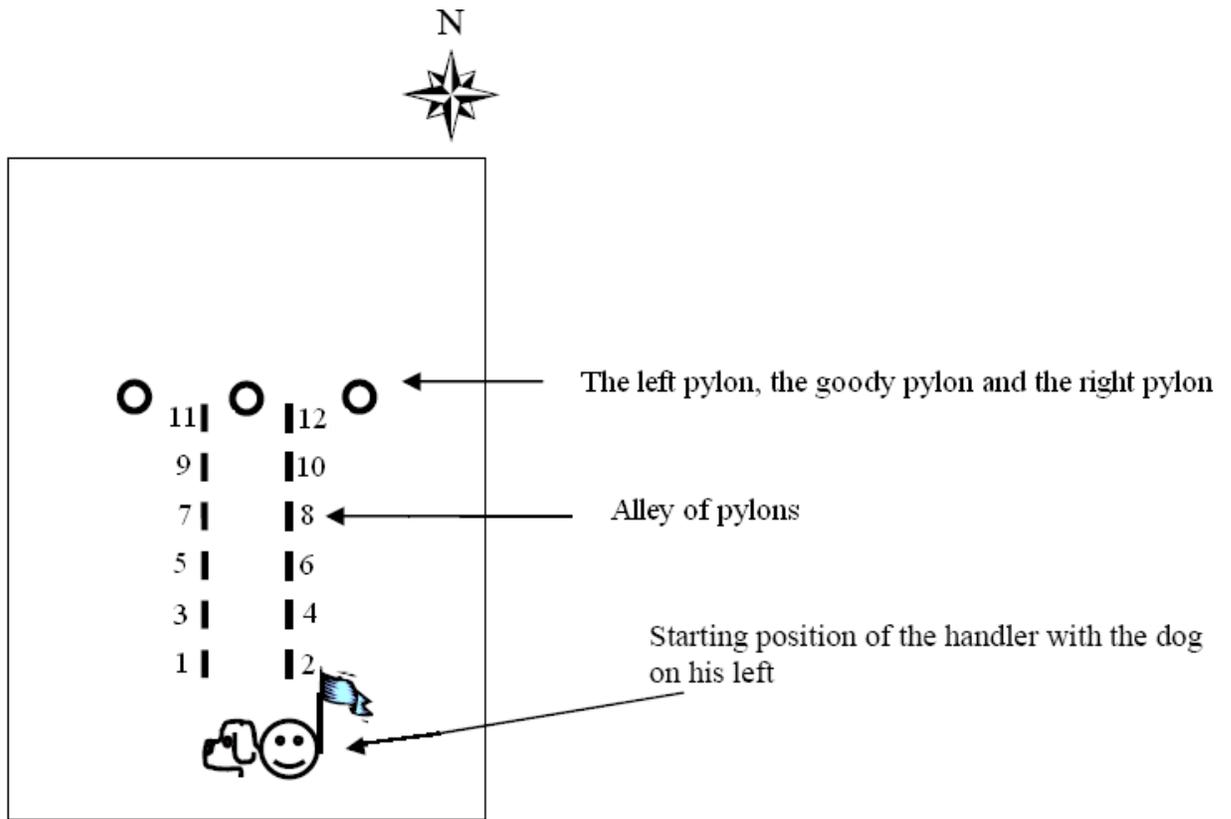
High



Very high

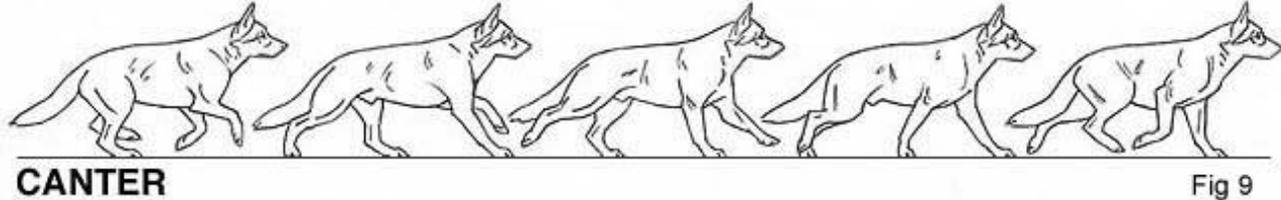


Appendix II **Alley – pylon counting**

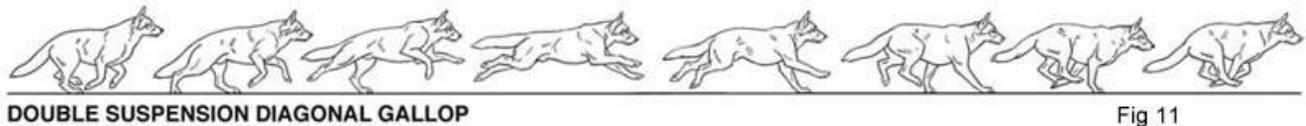


Appendix III Speed of movement - Gallop

There are also two kinds of gallop: a supported gallop known as the canter, and the suspended, high speed gallop. The canter in the dog is no different than in the horse (Fig 9). It is a three beat gait, and a typical sequence would be right rear first, left rear and right front together, and finally left front. It is a parallel gait with, in the case of a right lead, the left feet of both front and rear landing before the right feet of both front and rear. On a left lead, the reverse would be true.

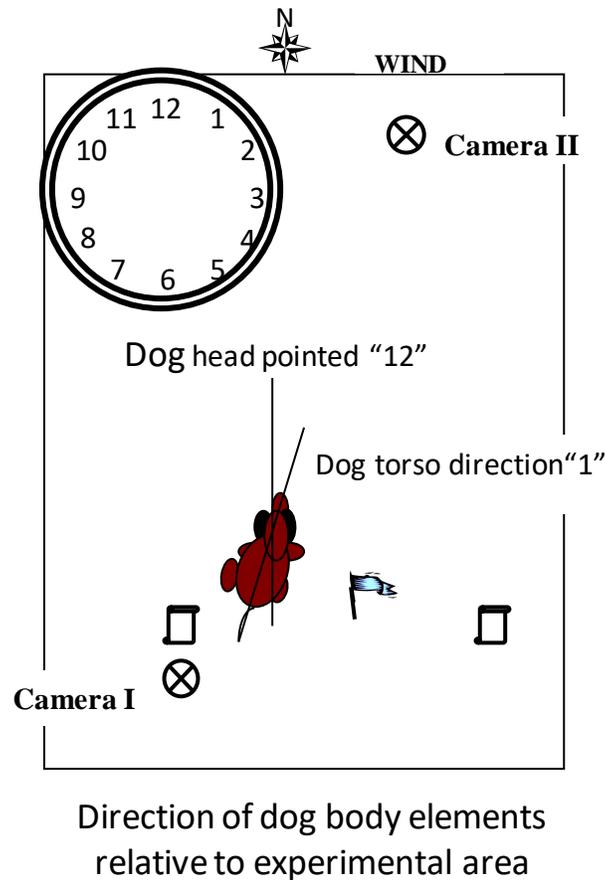


The gallop is the high speed, pursuit gait, with maximum extension and maximum exertion. There are two kinds of gallop: the single suspension, parallel gait exhibited by the horse (Fig 10), and the double suspension, diagonal gait most dramatically demonstrated by the cheetah, the fastest mammal on earth. The GSD shows the gait sequence of the cheetah (Fig 11). A typical, four beat sequence would be right rear, left rear - a long, leaping period of suspension - left front, right front - and a brief, secondary period of suspension.



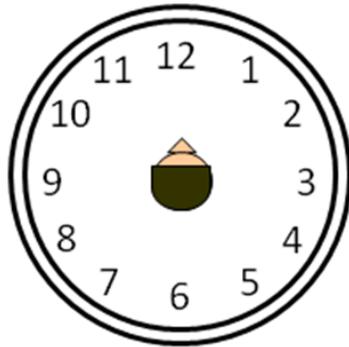
Source: http://www.shawlein.com/The_Standard/08_Overview_of_Gait/Overview_of_Gait.html

Appendix IV Direction relative to Experimental Axis or Handler

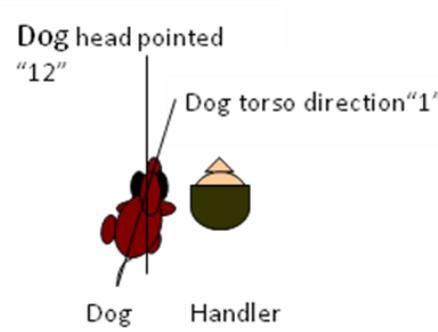


In experiments CDEF, the direction of the dog's body elements is determined with respect to the axis of the experimental area. In experiments AB the direction of the handler is towards 12 with respect to the axis of the experimental area, so the direction of the dog's body elements will be the same whether measured against handler or the axis of the experimental area. Therefore, for experiments ABCDEF the above directional measures are used.

However, in future experiments the position of the dog relative to that of the handler takes a central role. In those experiments, the direction will be a measured relative to the handler as explained below. This should be indicated in a comment in the transcripts.



12 is where the handler's body and head points



Direction of dog body elements relative to handler

Appendix IV Definition “influence”

Als de hond dusdanig beïnvloed wordt door de handler dat de trial niet meer valide is voor het onderzoek, dan wordt de trial uitgesloten van de analyse.

Het begrip “influence” komt niet voor in het ethogram maar hier wordt uitgelegd in welke omstandigheden “influence” gebeurt.

Met “Influence” worden de gedragingen van de eigenaar ten opzicht van de hond bedoeld die duidelijk fysiek de hond beïnvloeden in zijn gedrag. Voorbeelden:

- de eigenaar trekt aan de lijn van de hond om hem in de zit positie te krijgen.
- de eigenaar trekt aan de lijn om de hond van richting te laten veranderen.

Dog Cognition is zich bewust dat de geurtaal van de eigenaar en de experimenter ook invloed heeft op de hond. Daarnaast zijn er bewegingen van de eigenaar die de hond niet fysiek raken maar wel zijn gedrag beïnvloeden.

We kiezen ervoor dat alleen die gedragingen als “influence” worden gescoord die direct de hond duidelijk beïnvloeden door fysieke manipulatie van de eigenaar.

Dus als een van de onderstaande gedragingen gescoord kunnen worden

pulls leash

`<atomic arg1="handler">pulls_leash</atomic>`

`<atomic arg1="handler" arg2="some" arg3="slightly">pulls_leash</atomic>`

`<atomic arg1="dog" arg3="hard">pulls_leash</atomic>`

arguments1: handler, dog, experimenter, cameraman1, cameraman2

(optional) arguments2: some, frequent

(optional) arguments3: slightly, hard

{definitions:

none: no tension on the leash at all

some: leash tension is visible, but is not more frequent than in every 9th step

frequent: leash tension is visible more frequent than in every 9th step

slightly: the one who is pulling the leash doesn't really have an effect on the individual at the other end of the leash

hard: the one who is pulling the leash has a clearly visible effect on the other individuals body }

handler pulls dog

`<atomic>handler_pulls_dog</atomic>`

{definition:

handler pulls dog: the handler gives a pull on the leash and pulls the dog closer to himself }

handler bends over dog

`<atomic>handler_bends_over_dog</atomic>`

handler pushes dog down

`<atomic>handler_pushes_dog_down</atomic>`

{definition:

pushes down: the handler forces the dog to sit by pushing down its rear. }

handler steps over dog

`<atomic arg1="left">handler_steps_over_dog_with</atomic>`

arguments: left, right

handler steps on dog

`<atomic>handler_steps_on_dog</atomic>`

{**definition:**

steps on dog: happens when the handler steps backward, doesn't see the dog and steps on it, not deliberately}

handler frees dogs leg of leash

`<atomic>handler_frees_dogs_leg_of_leash</atomic>`

{**definition:**

handler frees dogs leg of leash: happens when the legs of the dog are hindered by the leash and the handler ends this hindrance.}

handler holds dog head away from goody pylon

`<atomic>handler_holds_dog_head_away_from_goody_pylon</atomic>`

handler pushes dog into direction

`<atomic arg1="12">handler_pushes_dog</atomic>`

arguments: 1,2,3,4,5,6,7,8,9,10,11,12

Appendix V Definition “ruiken vs. checken”

Vooral bij experiment D passeren sommige honden de kleinen pylonen waarbij het lastig kan zijn om het verschil tussen ruiken aan de pylon of alleen checken van de pylon te onderscheiden. We hebben de volgende beslissingen genomen:

Ruiken: met ruiken aan een object bedoelen we dat de hond aan een object snuffelt en daarbij blijft staan. Dus de lichaamstaal tijdens het ruiken stopt.

Checken: met checken van een object bedoelen we dat de hond tijdens het passeren aan het object snuffelt maar daarvoor niet staan gaat staan. Dus de lichaamstaal van de hond stopt niet.

De verklaring voor dit verschil zit in de regel van drie. De regel van drie bestaat uit drie fasen: observeren, checken en antwoorden. We gebruiken de notatie ruiken als de hond in fase drie (antwoorden) zit; hij stopt met lichaamstaal omdat hij zich op het ruiken concentreert.

Bij checken stopt de lichaamstaal van de hond niet omdat hij in fase 2 (checken) is, en nog niet in fase drie (antwoorden).

ruiken:

dog sniffs at pylon

`<atomic arg1="start_pylon">dog_sniffs_at_pylon</atomic>`

arguments1: **place**

arguments2: 1,2,3,4,5,6,7,8,9,10,11,12

checken (nieuwe code):

dog checks pylon

`<atomic arg1="start_pylon">dog_checks_pylon</atomic>`

arguments1: **place**

arguments2: 1,2,3,4,5,6,7,8,9,10,11,12