



Social learning in dog training: The effectiveness of the Do as I do method compared to shaping/clicker training



Claudia Fugazza*, Ádám Miklósi*,¹

Department of Ethology, Eötvös Loránd University, Budapest, Hungary

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ABSTRACT

Dog training methods traditionally rely on individual learning (mainly operant conditioning). Yet dogs are adept in acquiring information socially and are able to imitate humans. Dogs' predisposition to learn socially has been recently introduced in dog training with the Do as I do method. With this method dogs first learn to match their behaviour to a small set of actions displayed by a human demonstrator on command 'Do it!' and later are able to generalise this rule to use it to learn novel actions. In the present study, we compare the effectiveness of the Do as I do method with that of shaping/clicker training, a method that relies on individual learning, for teaching dogs two different kinds of actions: a body movement and an object-related action. As measures of effectiveness, we use the number of dog-trainer pairs experienced with either method, that succeed in obtaining five performances in a row of the predetermined action within 30 min and the latency to the fifth performance. Additionally, we assess the effect of these training methods on dogs' memory of the trained action and its verbal cue in different contexts. Our results show that the Do as I do method is more effective than shaping/clicker training to teach dogs object-related actions within a relatively short time and suggest that this method might be also applied for training body-movements. Importantly, the use of social learning enhances dogs' memory and generalisation of the learned action and its verbal cue.

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1. Introduction

Until very recently little use of social learning mechanisms has been made in formal dog training, as training methods relied mainly on non-social forms of associative learning (Mills, 2005). Among the various training methods that follow operant conditioning rules (Skinner, 1951), shaping/clicker training is a technique in which the spontaneous behaviour of the animal is gradually shaped by means of strategically timed reinforcements, using the sound of a clicker as a conditioned reinforcement and food as a primary reinforcement (e.g., Veeder et al., 2009). Thus, the animal learns gradually and individually, by trial and errors, what actions are followed by a reward. In shaping procedures, complex actions are simplified by training simpler steps towards the final goal, according to a plan or programme of instrumental contingencies (Lindsay, 2000). The main role of the trainer during the training procedure is that of delivering the secondary

reinforcement with proper timing, followed by the food reward. With regard to laboratory animals, for which the interactions with the experimenters may be a stressful situation, this training method has proven useful to reduce stress during manipulations and other laboratory activities (e.g., Coleman and Maier, 2010; Lambeth et al., 2006; Bassett et al., 2003). This training method is also very popular among dog trainers (e.g. Pryor, 1999, 2005).

Several studies have provided robust evidence that dogs are skilful in learning socially from both con- and heterospecifics (Kubinyi et al., 2009 for review). Dogs trained by the Do as I do procedure (Topál et al., 2006) were able to functionally imitate actions shown by a human experimenter (see also Huber et al., 2009; Fugazza and Miklósi, 2014a). With this method, dogs first learn by operant conditioning rules to match their behaviour to actions shown by a human demonstrator on command 'Do it!' (the trainer shows demonstrations of familiar actions and rewards the dog for performing actions that functionally match the demonstrated ones). Later dogs are able to generalise this 'imitation rule' to novel actions and different demonstrators (see Topál et al., 2006; Fugazza and Miklósi, 2014a for details on the training procedure). It is surprising that, despite the wide scientific literature providing evidence of dogs' predisposition to learn socially from humans, only very

* Corresponding authors.

E-mail address: claudia.happydog@gmail.com (C. Fugazza).

¹ MTA-ELTE Comparative Ethology Research Group.

few studies (Slabbert and Rasa, 1997; McKinley and Young, 2003) focused on the use of social learning in the applied field of dog training. A training method relying on learning socially from humans – the Do as I do method – was recently introduced in the dog training practice (Fugazza, 2011). In a previous study, we assessed its efficiency for training object-related tasks (Fugazza and Miklósi, 2014b). We found that this method is more efficient than shaping/clicker training for teaching dogs complex object-related tasks and goal-directed sequences of actions. We defined efficiency as the time needed to obtain the first occurrence of the behaviour and, as measures of efficiency, we used the number of dog-owner pairs succeeding to accomplish the task within a time limit of 15 min and the latency to the first occurrence of the predetermined behaviour.

Trainers and owners usually require dogs to perform the trained actions reliably – not only once, during the training procedure. Furthermore they require that dogs perform the trained actions on cue, rather than imitating a demonstrator, and also in different contexts (Mills, 2005). We define a training method effective if it allows reaching these objectives in a relatively short time.

Thus in the present study, we compared the Do as I do method and shaping/clicker training with regard to two objectives: (1) behavioural consistency during training – i.e. performing the required action repeatedly and (2) memorisation and generalisation to different contexts of the trained action and its verbal cue – i.e., performing the trained action after a delay, when verbally required by the owner, in different contexts.

To assess the effect of the two methods with regard to behavioural consistency we measured the number of dogs succeeding to perform five times in a row the action to be trained within a 30 min time limit and the latency to the fifth performance. To assess the memorisation and ability to generalise the trained action we used the number of dogs that performed the trained actions on cue in the same context where the training took place, and also in a different context.

We aimed also at providing information on the effectiveness of the training methods with regard to different behavioural goals to be achieved, e.g., train object-related actions and body movements, because previous studies did not include body movements. Consistent with our previous results, we expected the Do as I do method to be quicker for training object-related actions (Fugazza and Miklósi, 2014b), not only with regard to the first occurrence of the predetermined action but also with regard to more performances of it in a row.

Regarding the body movements, it is suggested that their imitation is more difficult than the imitation of object-related actions for all the species in which this has been tested (see Huber et al., 2009). Thus, we expected dogs to show difficulties in learning body movements with the Do as I do method.

With regard to dogs' memory and generalisation of the trained action and its cue, it is known that dogs are able to imitate observed human actions after delays ranging from 40 s to 10 min, even without motor practice (deferred imitation – Fugazza and Miklósi, 2014a). Thus, we expected that the demonstration performed by the owner might enhance dogs' memory of the trained action and their ability to generalise it across contexts in training situations. In humans observing someone performing an action can result in a memory benefit comparable to the benefit associated with producing the action (Cohen, 1981, 1983; Mulligan and Hornstein, 2003). We hypothesised that the use of the Do as I Do method, in which dogs observe and also produce the action, would boost dogs' memory and generalisation of the trained actions, compared to a training method that relies only on individual learning (i.e., only producing the action).

2. Methods

2.1. Subjects

A total of 38 dog-owner pairs were recruited for this study. All the pairs had experience with training. Subjects were divided in two groups (DAID group $N=20$ and SHA group $N=18$) according to their skills and experience with specific training methods: in the DAID group we recruited owners who had previously passed a dog-training exam with their dogs for the Do as I do method (see Fugazza and Miklósi (2014b) for details about the exam). In the SHA group, we recruited professional dog-trainers who had studied shaping/clicker training during their education for becoming dog-trainers and used this method in their practice. This way we ensured that all the pairs were skilled and experienced with the specific training method they were required to use during the tests. The participants were informed about the aim of the study. Dogs were adult, from 1 to 11 years (SHA group: mean age 5.9 years, $SD \pm 3.5$; DAID group: mean age: 5.4 ± 2.6 years) and belonged to various breeds. The two groups were balanced for breed-group and age as much as possible. All the dog-owner pairs were living together since at least 9 months, all dogs practiced some sports and training activities with their owners and had extensive experience with training. All the subjects lived in urbanised areas in northern Italy or in the Barcelona area (Spain).

2.2. Experiment 1

The tests were carried out in different dog schools in Italy and Spain (Italian dog schools: Happy Dog School, Freedog, Good Boy, Allevamento dei Grigi Audaci; Spanish dog school: Ludocan), indoor or outdoor in fenced areas, according to the spaces available in the facilities. All dogs were familiar to the places where they were tested.

Each dog-owner pair was tested during two separate training sessions in which the owner was instructed to teach his/her dog two novel actions: a body movement and an object-related action, one per test/training session, and to make the dog perform this action five times in a row. We chose the actions to use in the tests according to lists of already trained actions previously reported by the dog owners. This enabled us to find actions that were novel (i.e., never trained before) for all the dogs in our sample.

As *object-related action* we chose 'open a sliding door': the door of a white cabinet ($95 \times 81 \times 30 \text{ cm}^3$) was positioned 5 cm already opened so that the dog could insert its muzzle or paw to push it open. An experimenter positioned the cabinet's door back in the starting position after the dog's performance (and also after the owner's demonstration in the Do as I do tests).

As *body movement*, we chose the action 'jump in the air': the dog was required to raise at least the front paws from a standing position. This was the only possible body movement that we found to be novel for the dogs in our sample.

The order of administration of the two tasks (i.e., teach body movement first or teach object-related action first) was randomised. An inter-test interval of at least 20 min elapsed between the two subsequent training sessions. The timeline for a training session was 30 min: if the owner did not reach the predetermined goal (i.e., five performances in a row of the predetermined action) within this time limit, the test ended and the result was considered as a failure. Owners were informed that they could decide to stop the test earlier if they thought their dog was tired or stressed. Owners were instructed to stay at 1.40 m from the cabinet when they trained the object related action and at least 3.50 m from the cabinet when they trained the body movement.

DAID group: Owners were instructed to use only the Do as I do method. They were required to ask their dogs to stay and pay

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