Pattelog — white paper: the scientific basis

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Summary

Pattelog suggests the next exercise for an owner's dog. This document sets out the learning principles behind these suggestions, their level of evidence, and what we chose without evidence.

- **A skill** is worked on in steps, along three dimensions: duration, distance, distraction. Only one is raised at a time.
- **After each session,** the owner records « Réussi » (Success), « Partiel » (Partial) or « À retravailler » (Needs work). Three Success ratings in the last five sessions: the step is acquired and the app suggests moving up.
- **Three tiers:** « Acquis » (Acquired: regularly successful), « Fiable » (Reliable: successful in several places), « Solide » (Solid: successful again after a long break).
- **The dog's state counts:** a session where the dog was uneasy or tired counts neither for nor against.
- **Acquired steps come back for review** at increasing intervals, with no accumulated backlog and no day streak.

Most of these principles are practitioner knowledge. Few rest on an experiment conducted on dogs, and we found no published numerical criterion for moving from one stage to the next: ours are hypotheses, and two are not yet set.

What we ask of you: tell us where this document is wrong. It is not written by researchers. Seven specific questions follow this summary.

Questions for experts

A two-line answer to one of these questions already helps us. To reply: bonjour@pattelog.com.

1. **Acquisition.** Three sessions out of five, each with about four correct trials out of five: is that too little, too much, or the wrong criterion? Which one do you use?
2. **The owner's judgment.** How can we help a beginner judge Success without overestimating their dog?
3. **Change of place or difficulty.** When you change place or increase one dimension, by how much do you lower the rest, and how fast do you move back up?

4. **Generalization.** After how many places do you consider a behavior generalized? Does it depend on the skill? Is the word « Fiable » (French for "reliable") at risk of being read as "I can let my dog off the leash"?
5. **Maintenance and reviews.** After how long without practice does an acquired behavior degrade, and what gives way first? Does a review scale of 3, 7, 14, 30, 60 then 90 days make sense? Do you know of a study on the long-term retention of a trained behavior?
6. **The dog's state.** Which signs can a beginner owner record reliably after a session? Should a session where the dog was uneasy count?
7. **What is missing.** Which important principle is absent or wrong in this document?

Why this document

Pattelog is a logbook for dog training.

The app is aimed at two audiences:

- **Owners**, in a club or on their own, who train at home and in their neighborhood. They do not always know what to work on, or when to make an exercise harder.
- **Volunteer club instructors**, who are short of time. They prepare a class, send a recap to their class and follow each dog from one class to the next.

An app that suggests the next exercise makes a trainer's decisions: when to increase the difficulty, when to go back, when to review. These decisions must rest on what is known about dog learning, and state clearly what is not known.

One question comes before the others: what is an acquired skill?

Our evidence scale

Most rules of dog training are practitioner knowledge: widely taught, rarely tested by an experiment. Each source in the table "What the sources say" therefore carries one of the four levels below. Results on humans (reviews, motivation) are level 2.

Level	What it is	What it allows
1	Published experiment on dogs	A proposed rule, citing the limitations of the study
2	Result established in humans or another species	A hypothesis, to be checked in dogs

Level	What it is	What it allows
3	Text by a recognized practitioner, read in the original	A default rule, which the owner or the instructor can change
4	Secondary source, or text we could not open	Nothing, until it is checked

For each source, the list at the end of the document states whether we read the full text or only its abstract. When we read only the abstract, the level remains that of the study, but the rule derived from it remains a hypothesis.

When no source sets a threshold, we choose one and say so. The main ones are grouped in the section "What we do not know".

What the sources say

The level of evidence refers to the scale above; "abstract only" marks a study whose full text we did not read.

Principle	What the source says	Level
Three dimensions of difficulty	Duration, distance and distraction break down the criteria of a training plan (Donaldson 2018, p. 14). We did not find the origin of the expression "the 3 Ds".	3
One criterion at a time	Law 2: train only one thing at a time. Law 4: when introducing a new criterion, temporarily relax the old ones (Pryor 1985, p. 54-55). Pryor specifies that only her first four laws come from the laboratory. Lowering the other two dimensions is a practitioners' extension.	3

Principle	What the source says	Level
Move up, stay, move down	Sets of 5 trials: 4 or 5 correct, move up; 3, stay; 2 or fewer, move down (Donaldson 2018, p. 17). Her glossary gives a stricter threshold as an example: move up at 5 out of 5, stay at 3 or 4 (p. 27). After two failed attempts to move up, split the step (p. 18). The rule applies within a session.	3
Stages of learning	Acquisition, fluency, generalization, adaptation: the model of Haring and Eaton, in Haring et al. (1978), which comes from special education. We read it only through two secondary sources. "Maintenance" appears in another list, that of Alberto and Troutman in applied behavior analysis, cited by other authors (Kubina and Wolfe 2005). The certification framework CCPDT 2026 cites all five. We did not trace how "maintenance" arrived in dog training.	2 and 4
Spacing sessions	For an equal number of sessions, 1 to 2 per week do better than one per day, and one session does better than three in a row (Demant et al. 2011, 44 laboratory beagles, abstract only). Meyer and Ladewig 2008 (18 beagles, read through a secondary site) points the same way: fewer sessions needed at one per week, but fewer days at five per week.	1 for Demant, 4 for Meyer and Ladewig
Retention	All of Demant's groups keep a high level four weeks later. Four exceptional dogs out of five still recall 3 to 9 object names out of 12 two years later (Dror et al. 2024). We found no study that compares review intervals.	1

Principle	What the source says	Level
Right after learning	Learning another task immediately afterward prevents the progress measured one week later. Sleep, walking and play do not prevent it (Kis et al. 2017, 53 dogs). Thirty minutes of play do better than rest: 26 trials versus 43 to relearn the next day (Affenzeller et al. 2017, 16 Labradors, abstract only).	1
New place	Practitioners say that dogs generalize poorly and progress by changing context (Donaldson 2018, p. 88). In an unfamiliar place, only the response to the recently learned cue drops, not the response to the well-known cue (Braem and Mills 2010, 12 dogs, abstract only). A master's thesis finds the behavior retained at home one month later (McGuirk 2023). We found no study showing that generalization speeds up from place to place.	1 and 3
How the cue is given	The response drops when the cue comes from a recording, or when the person giving the cue is partly hidden, at about 2.5 m (Fukuzawa et al. 2005, abstract only).	1
Timing of the verbal cue	Two schools. Build the behavior before naming it (Donaldson 2018, p. 19 and 25). With a lure, the verbal request opens each trial (Dunbar 2007).	3
Aversive methods	Across 92 dogs from 7 schools, the aversive and mixed groups show more stress behaviors. Only the aversive group shows a larger rise in cortisol (measured in 31 dogs) and a more "pessimistic" bias than the reward group (Vieira de Castro et al. 2020). The study is not randomized.	1

Principle	What the source says	Level
Order of interventions	Health and physical needs first, then arranging the situation, positive reinforcement, reinforcement of an alternative behavior; then negative punishment, negative reinforcement or extinction, in no order of preference; positive punishment last (IAABC, Friedman's hierarchy).	3
Owners' reading of stress	Of 1,190 owners surveyed, the subtle signs (turning the head away, yawning, licking the nose) are cited more rarely (Mariti et al. 2012). We read it only through a secondary site.	4

Spaced review: what can be said

- **In humans,** spacing practice improves the memorization of words and facts: 259 comparisons out of 271 point that way (Cepeda et al. 2006).
- **Increasing intervals do no better than equal intervals** two days later, in a study on the scale of a single session (Karpicke and Roediger 2007). Over several weeks, one study finds the same final score at eight weeks, with better scores along the way (Kang et al. 2014, abstract only).
- **Physical skills also erode without practice,** less quickly than cognitive tasks in one meta-analysis (Arthur et al. 1998).
- **In dogs, we found nothing.** No study we found tests a review calendar. Of the two studies that compare training schedules, the only one that tests retention finds no effect of schedule at four weeks (Demant et al. 2011).

Pattelog's review scale is therefore a design choice, inspired by human memory. We keep it increasing: Kang's study finds the same final score and better scores along the way, and the reminders grow further apart over time. Its intervals are a starting hypothesis, to be adjusted with what the logbook shows.

The owner's motivation

A dog only progresses if its owner keeps practicing. The results below concern humans, almost all outside dog training: what we draw from them is an extrapolation.

Finding	Source	What we draw from it
Purchases speed up as the free coffee approaches: the interval between two purchases shortens by about 20% from the first to the last stamp.	Kivetz et al. 2006, a café's loyalty card	The next step is always visible.
A progression already begun is more often completed: 34% versus 19%.	Nunes and Drèze 2006, a car wash	At the start, the owner indicates what their dog already knows: the progression does not start from zero.
Three needs sustain motivation: a sense of competence, autonomy, connection.	Ryan and Deci 2000	The owner can change every suggestion from the app.
Feedback that informs sustains motivation; feedback that controls holds it back.	Deci, Koestner and Ryan 1999, meta-analysis; this contrast rests on four experiments	Feedback describes what happened, without judgment.
In education, gamification has positive but small effects on average.	Sailer and Homner 2020, meta-analysis, abstract only	Gamification is a supplement, not the core of the product.
Displaying an intact streak increases the choice to continue. Displaying a broken streak reduces it (45% of participants continue, versus 61%) and worsens mood in the short term.	Silverman and Barasch 2023	No day streak.
A plan agreed with the owner goes hand in hand with better adherence to the advice. This is a correlation.	Daniels et al. 2023, behavior consultations, abstract only	The app suggests, the owner decides.

We found no study on homework between two classes, the reasons for dropping out of a club, or the lasting use of a dog-training app. Nor did we find one that measures lasting guilt linked to streaks: we leave them out as a precaution.

How Pattelog translates these principles

The rules below are working hypotheses.

What a skill is

A skill (recall, "stay") breaks down into steps. Each step is worked on in a condition, described by three dimensions, each graded in notches: duration, distance and distraction. An exercise works one step in one condition. The place (home, yard, park, forest) is a label, not a notch of difficulty.

A dog's progress is never written by hand. It is computed from the recorded sessions, each one dated.

The rules

Topic	Proposed rule
Recording a session	After each session on a step, the owner chooses Success, Partial or Needs work. Success means: about 4 trials out of 5 correct on the first cue, without help. Partial, about 3 out of 5: stay at this level. Needs work, 2 or fewer: move down one notch. These figures are a guide for the owner, not a required count.
Acquired	A step is Acquired in a condition when 3 of the last 5 sessions there are rated Success. The app then suggests moving up one notch. The tier is recomputed at each session: it can be lost.
Reliable	The step is successful in several different places.
Solid	The step is successful in a review that follows a long interval without practice.
One dimension at a time	When one dimension goes up, the app suggests lowering the other two.

Topic	Proposed rule
New place	The app suggests starting again easy. As an exception, a single Success is enough to move back toward the notch reached elsewhere.
Dog's state	An optional tap after the session: focused, distracted, uneasy or tired. Distracted: a Success counts; a Needs work does not count the first time, and the app suggests less distraction. Uneasy or tired: the session counts neither for nor against, and the app suggests something easier.
Distracted twice in a row	On the same step, the second Needs work in a row counts, and the app suggests moving down one notch.
Reviews	Each acquired step comes back at increasing intervals. Starting scale: 3, 7, 14, 30, 60 then 90 days. The first failure in review does not count against the dog: the interval moves back one notch. After two failures in a row, the step goes back to « En cours » (In progress).
Response speed	It is not measured. "On the first cue" captures only part of it.
Verbal cue	Each exercise indicates at which step the word comes in. The instructor can change it for their class. A word the dog already knows is never blocked.
After something new	No second learning in the hour that follows a new step (duration tested by Kis et al.). At the end of the session, a line suggests a moment of play.

The owner stays in control: each suggestion from the app (easier, same notch, another place) can be changed in one tap. The tiers take up the stages of learning: Acquired for acquisition, Reliable for generalization, Solid for maintenance. Fluency has no tier, and adaptation is not covered.

Club programs

This part is the least advanced. A program would take one of two forms:

- **In order:** the steps follow one another, as in puppy school or in a beginners' class.

- **By level:** a set of exercises worked on at every class, in no order, as for an obedience level. The app flags two or three of them to emphasize: the ones the class has mastered least.

The instructor plans freely. Each dog advances at its own pace, and an exercise not yet acquired remains to be worked on after the class.

What the app never does

- It describes and recommends only reward-based methods. Aversive tools and gestures are excluded everywhere.
- It does not rank dogs against each other, does not count a day streak and does not give a numerical score.
- It never shows a damaged skill or an unhappy dog because the owner has not practiced.
- It does not accumulate overdue reviews: one or two are suggested in the week.
- It suggests no protocol for a behavioral disorder (biting, aggression, intense fear, separation distress). It points to a veterinarian and a behavior professional.
- It does not treat as a training problem a dog that suddenly refuses, limps or avoids a position: veterinarian first.

What we do not know

We found no published criterion that says when a dog moves from one stage of learning to the next. The choices below are therefore ours; two thresholds remain to be set.

Choice	Why it is fragile
Acquired at 3 successful sessions out of 5	The figure has no source. It depends on a demanding Success, which the owner judges alone.
Success judged by the owner	A beginner often overestimates their dog. We do not know by how much.
Number of places for Reliable	Not set. Two, three, five?
Interval for Solid	Not set. Four weeks, three months?
Review scale from 3 to 90 days	The principle comes from human learning of facts; the intervals themselves have no source. A behavior learned by a dog is probably not forgotten in the same way.

Choice	Why it is fragile
A single Success to move back up in a new place	Practitioner knowledge (Donaldson), without measurement. One study even suggests that only the response to a recently learned cue drops in a new place: starting again easy would then be unnecessary for a well-established behavior.
Place with no order of difficulty	A park on a Saturday is harder than a living room. We rely on the "distraction" dimension to carry the difference.
Neutral session when the dog is uneasy	A success despite stress may signal real mastery. We prefer to underestimate rather than push a worried dog.
The dog's state recorded by the owner	Subtle signs of stress are hard to read. The owner may also stop reporting them.
Response speed not measured	A slow but correct dog and a fast dog have the same tier.

Two problems stem from the Reliable tier:

- **Reliable can be read as a promise of safety.** An owner who reads Reliable on a step of recall may let their dog loose near a road.
- **In a club, the place does not change.** A dog cannot become Reliable through classes alone. We do not yet know what the instructor must see, nor whether Solid can be obtained without Reliable.

Research direction

Each recorded session is a measure of retention: we know how many days the step had gone without practice, and whether it was successful. With enough dogs, these data can show at what rate a learned behavior is maintained.

What the app would record for each session:

- the step, the condition and the place;
- the result and the dog's state;
- the number of days since this step was last practiced;
- the dog's breed and age.

The limitations we see:

- **Results are judged by the owner,** in places and states that vary. The owner may record successes more readily than failures.
- **If the app always chooses the same intervals,** we learn nothing about the others. They will have to be varied a little.
- **The adjustment of intervals will first be done dog by dog.** Separating the effect of breed from that of age, owner and method takes thousands of dogs.

This is an intention, not a protocol. The use of these data for research remains to be examined with regard to privacy and the owners' consent, before any collection.

Sources

Sources consulted on 18 November 2026. The last column says what we actually read.

Dog training and learning

Reference	Read
Donaldson, J. (2018). *Dog Training 101*, Course Guidebook (course no. 9418). The Great Courses.	Full text
Pryor, K. (1985). *Don't Shoot the Dog! The New Art of Teaching and Training*. Bantam.	Full text (scan, page numbers within ± 1)
Dunbar, I. (2007). Lure Reward Training. Dog Star Daily. Page	Page, through a reading tool: citation to be rechecked
Haring, N. G., Lovitt, T. C., Eaton, M. D. and Hansen, C. L. (1978). *The Fourth R: Research in the Classroom*. Charles E. Merrill.	Not read. Stages confirmed by Elliott, Zawoyski and Ayres (2023), Journal of Behavioral Education, PMC9979893, and by a fact sheet from the Center on MTSS (2023)
Kubina, R. M. and Wolfe, P. (2005). Potential applications of behavioral fluency for students with autism. *Exceptionality*, 13(1), 35-44. Text	Full text
CCPDT (2026). *Handbook for Candidates, CPDT-KA*, item K58. Text	Full text

Reference	Read
Demant, H., Ladewig, J., Balsby, T. J. S. and Dabelsteen, T. (2011). The effect of frequency and duration of training sessions on acquisition and long-term memory in dogs. *Applied Animal Behaviour Science*, 133, 228-234. DOI	Abstract
Meyer, I. and Ladewig, J. (2008). The relationship between number of training sessions per week and learning in dogs. *Applied Animal Behaviour Science*, 111, 311-320. DOI	Abstract, through a secondary site
Kis, A. et al. (2017). The interrelated effect of sleep and learning in dogs. *Scientific Reports*, 7, 41873. DOI	Full text
Affenzeller, N., Palme, R. and Zulch, H. (2017). Playful activity post-learning improves training performance in Labrador Retriever dogs. *Physiology & Behavior*, 168, 62-73. DOI	Abstract
Dror, S., Miklósi, Á. and Fugazza, C. (2024). Dogs with a vocabulary of object labels retain them for at least 2 years. *Biology Letters*, 20(9). DOI	Full text
Braem, M. D. and Mills, D. S. (2010). Factors affecting response of dogs to obedience instruction. *Applied Animal Behaviour Science*, 125, 47-55. DOI	Abstract
McGuirk, J. N. (2023). *State- and Context-Dependent Learning Effects in Different Dog Populations*. Master's thesis, Virginia Tech. Text	Abstract and limitations
Fukuzawa, M., Mills, D. S. and Cooper, J. J. (2005). More than just a word: non-semantic command variables affect obedience in the domestic dog. *Applied Animal Behaviour Science*, 91, 129-141. DOI	Abstract
Vieira de Castro, A. C. et al. (2020). Does training method matter? *PLoS ONE*, 15(12), e0225023. DOI	Full text

Reference	Read
IAABC. *Position Statement on LIMA*, with Friedman's hierarchy. Text	Full text
Mariti, C. et al. (2012). Perception of dogs' stress by their owners. *Journal of Veterinary Behavior*, 7(4), 213-219. DOI	Abstract, through a secondary site

Motivation and memory in humans

Reference	Read
Kivetz, R., Urminsky, O. and Zheng, Y. (2006). The Goal-Gradient Hypothesis Resurrected. *Journal of Marketing Research*, 43(1), 39-58. DOI	Abstract, method and targeted passages
Nunes, J. C. and Drèze, X. (2006). The Endowed Progress Effect. *Journal of Consumer Research*, 32(4), 504-512. DOI	Full text
Ryan, R. M. and Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78. DOI	Full text
Deci, E. L., Koestner, R. and Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, 125(6), 627-668. DOI	Abstract, method and targeted passages
Sailer, M. and Homner, L. (2020). The Gamification of Learning: a Meta-analysis. *Educational Psychology Review*, 32(1), 77-112. DOI	Abstract
Silverman, J. and Barasch, A. (2023). On or Off Track: How (Broken) Streaks Affect Consumer Decisions. *Journal of Consumer Research*, 49(6), 1095-1117. DOI	Accepted manuscript: abstract, method and targeted passages

Reference	Read
Daniels, J., Busby, D., Chase-Topping, M. and Brown, S. (2023). I wish he'd listen. *Journal of Veterinary Behavior*, 63, 22-30. DOI	Abstract
Cepeda, N. J. et al. (2006). Distributed practice in verbal recall tasks. *Psychological Bulletin*, 132(3), 354-380. DOI	Authors' manuscript: abstract, method and targeted passages
Karpicke, J. D. and Roediger, H. L. (2007). Expanding retrieval practice promotes short-term retention, but equally spaced retrieval enhances long-term retention. *Journal of Experimental Psychology: LMC*, 33(4), 704-719. DOI	Abstract, method and targeted passages
Kang, S. H. K. et al. (2014). Retrieval practice over the long term: should spacing be expanding or equal-interval? *Psychonomic Bulletin & Review*, 21(6), 1544-1550. DOI	Abstract
Arthur, W. et al. (1998). Factors that influence skill decay and retention. *Human Performance*, 11(1), 57-101. DOI	Scanned text (targeted passages), tables partly illegible

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