

Beyond Bizarre: Nature, Culture and the Spectacular Failure of B.F. Skinner's Pigeon-Guided Missiles¹

Abstract: The article uses posthumanism and animal studies as a framework for making sense of B.F. Skinner's wartime project of training pigeons to guide missiles, with emphasis on explaining the negative response of the donors and the public. The article first considers the hypothesis that the donors' incredulity was evoked by the species of the animal. During World War II the United States began a massive program for the training of dogs for the military, and the campaign received unanimously positive publicity in the media. Possibly, thus, dogs were perceived as capable of bravery and sacrifice while pigeons were not. However, messenger pigeons had been traditionally incorporated into the war machine and were perceived as heroic. Thus, the analysis moves on to suggest that the perception of the project as ridiculous was related to the type of behavior performed by the animals: a behavior perceived as trained (artificially acquired) and not instinctive. The analysis then shifts into how the distinction between what is perceived as instinctive (natural) and learned (artificial) behavior influences the reception of different performances involving animals. Performances built around "natural" behaviors generate much stronger positive responses, even if the naturalness of these behaviors is a carefully crafted effect.

Keywords: animal studies, behaviorism, behavioral science, positive reinforcement, B.F. Skinner, pigeons, animal training, instinctive behavior, World War II, military animals, bioweapons

Nearly all modern techniques of social conditioning were first established with animal experiments.

John Berger, *Why Look at Animals?*

B.F. Skinner's wartime project of training pigeons to guide missiles to their targets is a largely forgotten episode in the history of both behaviorist science and American warfare. It is sometimes mentioned as an oddity, a military curiosity similar to other ill-fated attempts to weaponize unusual species of animals, such as the army's World War II work on the bat bomb or the Cold War project "Operation Big Itch," a plan of using fleas as bioweapons (Lockwood; Hamblin). What differentiates Skinner's project from the ones mentioned above is that the pigeons were not simply to be dropped from a plane along with explosives, but were to be trained in steering the missiles by pecking at a target. Through cables attached to the birds' heads, the pecking would mechanically steer the missile until it reached its target. The mission was supposed to end with the detonation of the bomb and the self-inflicted death of the pigeons. However the funding for the project was revoked in October 1944, and the pigeon bombs remained one of the military's many "bizarre problems of wartime research" (Caphew 854). One of the reasons why so little has been written about this project is a problem with conceptualizing a framework through which it could be explored. Other than the "cabinet of curiosities" narrative, there have not existed many strategies that

¹ Research leading to this publication was financed through a Miniatura 2 grant of the National Science Center, Poland, number 2018/02/X/HS2/03181.

make it possible to discuss this project in greater depth from an academic perspective: it is not seen as contributing to any body of disciplinary knowledge. It has also been difficult—for reasons described in detail in this article—to incorporate the story of the kamikaze pigeons into the classic popular narratives of animals in warfare, i.e. stories of heroism and courage. However, perhaps the recent emergence of new perspectives like posthumanism and animal studies can provide a framework for making sense of “Project Pigeon.” Perhaps, a re-examination of the pigeon bombs can also, somewhat synergically, offer a new perspective on behaviorism: the methodology that gave rise to Skinner’s pigeon-training endeavor.

Behaviorist psychology, as embodied in the North American context in the figure of B.F. Skinner, is rarely mentioned in genealogies of either animal studies or posthumanism. It does not appear productive for creating narratives that add to the current questioning of anthropocentrism and the growing interest in nonhuman subjectivity. On the contrary, behaviorism’s focus on techniques of controlling behavior, whether the behavior of nonhuman animals or of humans, reads like the pinnacle of anthropocentric arrogance, not increased sensitivity to “minds other than ours,” to quote C.L. Morgan, a British scientist whose influence on American behaviorism is undoubtable (Valsiner 153). Not to mention that within psychology radical behaviorism remains something of a shameful episode; dismissed and destined to be forgotten in due time. As Katherine Hayles has famously put it, in the behaviorist approach the mind is a “‘black box’ whose contents are unknown” (Hayles 94). The development of the neuro sciences has cracked this black box that behaviorism could not open, thus making the conceptual framework of behaviorism obsolete. It cannot be disputed that science has now moved in a different direction, and the (post)humanities that form a dialogue with it have followed. While Skinner’s “learning theory” still holds some use outside of the academia, in the real world, so to speak—as evidenced, for example, by Donna Haraway’s description of her uneasy acceptance of a behaviorist-based training approach for her beloved dog (Haraway 43–47)—even there behaviorism has become bracketed: yes, it is useful, but its limitations are obvious.²

Yet this article proposes a cautious recycling of behaviorism: a re-examination of Skinner’s wartime project of training pigeons to guide missiles; not with the goal of salvaging the accuracy of Skinner’s assumptions about learning, but with the hope that reading Skinner’s experiments against the grain, without much reverence for behaviorist dogma, can shed light on issues that contemporary posthumanist and animal studies scholars find important. These include, for example, questions about how the formation of analogies across species boundaries works and how the general public’s perception of species difference, culturally encoded but perceived as “natural,” has very palpable effects for the animals themselves and for the human-controlled projects they are involved in. Conscious of its limitations and critiques, I would like to use behaviorism as a provisional tool and methodological framework. Behaviorism can be something of a strategy of defamiliarization: a technology of explaining the behavior of both humans and non-humans that has been so deeply rejected in the contemporary humanities, that

2 For more information on how dog training has moved beyond behaviorism since Haraway’s report in *The Companion Species Manifesto* see Michał Pęgowski’s article “Your Dog is Your Teacher: Dog Training Beyond Radical Behaviorism.”

it offers a novel perspective. To put it bluntly, in a behaviorist framework, a pigeon guiding a missile, i.e. carrying out an assignment which is going to result in the bird's self-destruction, is executing precisely the same task as a mine detection dog seeking a mine (which could also potentially kill the dog): the animal is correctly performing a behavior for which it has been effectively trained using techniques based on positive reinforcement. It is working under the assumption that it is going to receive a reward when it completes the task successfully. However, in the public eye—as grasped from media accounts of Skinner's pigeons and contemporary mine detection dogs—the range of significations of these two animal performances could not be more radically divergent. The dog's behavior is interpreted as a performance of courage, dedication and sacrifice, while the pigeon's evokes disbelief and laughter (which, coincidentally, is the major reason why Project Pigeon was discontinued).

Behaviorism for Posthumanists

A few more words on the attempts to conceptualize behaviorism and its legacy are due before I can proceed to the training of kamikaze pigeons. Hayles's references to behaviorism in *When We Became Posthuman* derive from an attempt to tackle a different issue than the one taken on in this article: the use of analogy in conceptualizing the relationships between humans and machines. Hayles pins on behaviorism the popularization of the erroneous assumption that "because humans and machines sometimes behave similarly, they are essentially alike" (Hayles 94), an assumption made possible only because of the lack of access to the contents of the "black box." However, it is only Skinner's late work—his attempts at producing a teaching machine—that validates such criticism. The bulk of Skinner's laboratory research pertained to animals—not machines—and the possibly erroneous extrapolating had to do with using the results of the animal experiments to generalize about human behavior (Richelle 66–72). It has to be added, somewhat cautiously, that the idea of generalizing across species boundaries does carry with it some potential of human-animal boundary-blurring. Recognition that humans are just another animal is a concept that may spike the interest of scholars in animal studies and the broader posthumanities. While Arthur Koestler in his immensely influential *The Ghost in the Machine* complained about behaviorism's "ratomorphic view of man" (Koestler 17), this concept may actually sound appealing to today's cultural scholars, raised on Deleuze and Guattari's famous injunction to "write like a rat" (Deleuze and Guattari 240), which has by now been re-read and taken to heart by scores of scholars who see animality as a desirable quality in literature. The de-anthropomorphization of human behavior, through the consistent application of Morgan's canon—that is, British scientist Conwy Lloyd Morgan's exhortation against anthropomorphism in interpreting the behavior of animals—could attract scholars working on reconceptualizing the human.³ Even if we now know that

3 For more on how behaviorism contributed to re-conceptualizing medical ethics, see Cathy Gere's *Pain Pleasure and the Greater Good*. Gere tells a narrative of medical ethics evolving from "the greater good" concept to "patient's rights." In this narrative, behaviorism is the last stand of the "greater good" concept at a time when considering the rights of individual patients was becoming the dominant paradigm. Gere's account is one possible explanation of the intense controversy

many of behaviorism's findings about animal learning do not stand up to contemporary ethological scrutiny, what remains exciting about Skinner's philosophical project is its radical refusal to separate humans from other animals.

However, while behaviorism shares some assumptions with the posthumanist discourses now used to dismantle enlightenment humanism—for example, it is a decidedly monistic worldview in its refusal to accept the mind-body dualism and its insistence on the materiality of the body—it completely lacks the self-awareness of itself as a discourse. For Skinner and for many of his followers also outside the academic world, behaviorism was not just a theory, it was the theory of learning. Behaviorism saw itself as science, blissfully unaware of its situatedness and discursive character. Skinner was deeply convinced that his technologies of behavior modification would be beneficial for the world if their application was in the hands of scientists, whom he saw as committed to both a search for truth and a project dedicated to promoting “the greater good” (Gere 165–66). It is also in the context of the greater good that Skinner viewed the role of laboratory animals; much in line with the long history of the use of animals as models of human bodies in experiments in physiology (Guerrini). There does exist a significant distinction in the way behaviorism approached the lab animal and the way that, for example, nineteenth-century vivisectionists did: to go back to the black box metaphor and extend it slightly by thinking of the entire body as the mysterious black box, the experiments that aimed at establishing the physiology of organisms, did indeed look inside the black box (though with tools much cruder than those at the disposal of contemporary neuroscience), while Skinner's behaviorism was interested only in placing the black box in different (and highly controlled) environments to establish how it could be made to respond in particular ways.⁴ Not to mention that elimination of punishment (and, by extension, physical pain) from the process of learning was Skinner's ultimate recommendation for both animal trainers and human educators.⁵

Of course, Skinner's interest was never truly in the animals themselves; it was in the discovery of general principles that could be applied to humans, non-humans and their interactions with the environment. It is from this perspective, Skinner's almost total lack of concern with species specificity, that the ethological attack on Skinner

generated by behaviorism and its eventual passing into obsolescence.

- 4 This is not to say that other behaviorist scientists, largely inspired by Skinner, were not interested in understanding how the brain works. The most famous experiment which constituted a turn away from Skinner's radical behaviorism toward contemporary neuroscience, and one which utilized a classic Skinner box, was James Olds and Peter Milner's study of rats implanted with electrodes in their brains self-stimulating the pleasure centers in their brains (1954). Even though Skinner clearly knew of these experiments and the ones that followed in their wake, he did not ever implant electrodes in the brain of his experimental subjects. Unlike e.g. Pavlov, Skinner also never surgically altered the bodies of the animals he was working with.
- 5 Skinner's forays into the practical world of animal training took the shape of several articles published in popular magazines, largely in the 1950s. These include the *Look* article “Harvard-Trained Dog” (1952) and the *Scientific American* article “How to Train Animals” (1952). In all of these Skinner argued for refraining from punishment, though not due to purely ethical reasons. Skinner argued that his earlier research had proven that basing behavior modification programs on punishment was not effective.

originated (Richelle 65–66). It is also from this perspective that the humanities have attacked behaviorism, as evidenced by Koestler's influential book and the scores of other articles that contributed to Skinner's gradual scientific demise, Chomsky's review of Skinner's *Verbal Behavior* constituting the most famous individual example of such critique (Chomsky). Finally, it is also the perspective that dominated in public opinion's negative reactions to Skinner's publications, especially his famous 1945 *Ladies Home Journal* article, titled "Baby in a Box," which publicized Skinner's so-called baby-tender, also known as the AirCrib, a machine that Skinner designed to ease childcare duties. Angry readers accused Skinner of equating babies with lab animals.⁶ It is behaviorism's ease of erasing species boundaries, its "one solution fits all species" approach, coupled with the refusal to consider higher emotions as underlying factors of behavior, that accounts for much of the controversy generated by Skinner's work.

However, a posthumanist reading of Skinner can also take behaviorism's universalizing and turn it around: instead of decrying the animal analogies as humiliating for humans, it can question the anthropocentrism inherent in such complaints. Instead of ridiculing Skinner's idea of blending the organic organism with mechanical elements, it can see this experiment as a prefiguration of the figure of the cyborg; suggesting another possible line of descent for posthumanist thought. These are most definitely readings that go against the grain of Skinner's intentions, but ones that are facilitated by his acceptance of cross-species analogies in learning. If humans and animals learn according to the same principles, then it is only a small mental leap to assume that their situations as decision makers can also have some sort of metaphorical correspondence, a possibility picked up by Ana Teixeira Pinto in her essay "The Pigeon in the Machine."

Reading Skinner's Pigeon Bomb

The cross-species analogy at work in Project Pigeon is—ironically—a kind of reverse analogy to the one usually associated with behaviorism: the assumption that if animals have been proven to be capable of behaving in a particular way, so can humans. Here, the analogy is that if humans can perform a certain behavior, so can animals. Oddly, the behavior is a suicide mission. While in this case the analogy is imposed on the project post-factum, as Skinner obtained funding from General Mills for working on Project Pigeon in the summer of 1942 and the first Japanese kamikaze attacks took place in 1944, it is not unwarranted (Capshew 842). Skinner was conscious of this analogy and suggested it himself: In the second part of his autobiography, he includes excerpts of an undated letter he wrote to colleague Dean Tate, where he comments directly on the Japanese kamikaze attacks: "Perhaps we can get American morale as high, but if not I have perfectly competent substitutes" (Skinner, *The Shaping of a Behaviorist* 256–57).

6 Many of the letters sent to the editors of *Ladies' Home Journal* and directly to Skinner are available in the B.F. Skinner Archives at Harvard University. Here follows an excerpt from a representative critical letter: "Caging this baby up like an animal just to relieve the Mother of a little more work." B.F. Skinner Papers. HUGFP 60.10, Box 1. Harvard University Archives. Cambridge, Massachusetts.

Sacrificing the lives of animals was, not surprisingly, a non-issue (Skinner, “Pigeons in a Pelican” 28).

In his autobiography, Skinner recalls the story of how he came up with the project of training birds to guide missiles to their targets: “a crackpot idea, born on the wrong side of the tracks intellectually speaking”(Skinner, “Pigeons in a Pelican” 28). The explanatory narrative provided by Skinner can be read as entangled with two concepts: cross-species analogy and biomimicry. Biomimicry is a term that has recently become popular in relation to design “inspired by nature;” that is, based on patterns observed in the non-human world.⁷ The biomimicry influence on the pigeon-guided missiles comes from Skinner’s observation of a flock of birds flying in formation alongside a train that Skinner was traveling in: “Suddenly, I saw them as ‘devices’ with excellent vision and extraordinary maneuverability. Could they not guide a missile?” (Skinner, *The Shaping of a Behaviorist* 241). This “Eureka” moment deserves a closer look.

Surprisingly, Skinner’s explanation has always been taken at face value: he saw a flock of birds and that made him think of the possibility of creating a pigeon-steered bomb (Caphshew 839–40). Yet, this is not a straightforward reasoning process. It was not, after all, the birds’ ability to fly that caused the sudden revelation. Rather, it was the fact that they did so in unison, in such orderly manner. The synchronized behavior of the birds at the same time reminded Skinner of the internal workings of a mechanical device, consisting of multiple elements working in synchrony with others, and suggested the possibility of exerting similarly intricate control over the animal in order to induce synchrony in a complex mechanical setup. The animal put the system into order and guaranteed its precision. In other words, it seemed easier and more reliable to Skinner to have the organic element control the mechanical elements of a device than vice versa. This conviction—Skinner’s staunch belief in the greater effectiveness and ease of controlling organic versus inorganic matter—is one of the explanations for the disbelief Skinner encountered, a fact duly recorded by Skinner who wrote in the “Pigeons in the Pelican” account of the project that “[t]he basic difficulty, of course, lay in convincing a dozen or so distinguished physical scientists that the behavior of a pigeon could be adequately controlled” (Skinner, “Pigeons in a Pelican” 33). However, it must be noted that the problem the engineers were struggling with at the time was indeed a problem of lack of adequate tools for controlling the deathly mechanical device from a distance: problems were encountered not with the behavior of the birds, but with the mechanical linkages translating the birds’ pecking into steering movements (Caphshew 145). In a way then, Skinner’s beliefs were vindicated: the birds were performing without fail.

The birds’ behavior was to result from an intricately designed human-directed behavior conditioning program. Such optimistic beliefs about the possibilities of behavior-modification account for the criticisms of behaviorism that suggest it holds a “blank slate” theory of mind (see, e.g. Pinker), but it must be emphasized that here

⁷ Biomimicry is a fascinating concept that has been taken up within the broader environmental humanities, but there is no direct point in discussing the different understandings and applications of biomimicry here. The popular science book credited for popularizing the concept is Janine Benyus’s *Biomimicry: Innovation Inspired by Nature*.

(and in many other instances) Skinner begins with an instinctive behavior (that of pecking), which is consequently augmented through a behavior-modification regimen. The pigeons steered the missile not by biting, pulling strings or turning a steering wheel using their beaks, but by continuously performing a naturally occurring species-specific behavior, i.e. pecking at the image of the target of the bomb: the success of the enterprise depends on their ability to maintain an instinctive behavior for a period longer than they “naturally” would. The kind of biomimicry implemented in Skinner’s design required the retention of the organic component: the bird was placed in the machine and remained there until the mission was completed (and the bird dead). For Skinner, this was the solution to the shortcomings of science at the time; but the gist of the effort of science was most definitely going in the direction of refinement of electronics, as pointed out in Ana Teixeira Pinto’s analysis of the project alongside the development of cybernetics (Teixeira Pinto 67–69). What accounts for the “backward” character of Skinner’s project from a scientific point of view was specifically his interest in controlling organic matter. This is why he himself calls his idea “born on the wrong side of the tracks, intellectually speaking” and continues to repeat that “my colleagues and I knew that, in the eyes of the world, we were crazy” (Skinner, “Pigeons in a Pelican” 36).

From the perspective of other scientists and potential donors, Skinner’s project seemed outlandish because of its reliance on the organic element, which—unlike Skinner—they saw as the weak link of the device. From the perspective of a posthumanist cultural critic, we could recognize in the entire apparatus a familiar figure: a cyborgish blending of the organic and the mechanic. A full discussion of cyborgs exceeds the scope of this paper, but almost any culturally literate member of the public can instantly evoke examples of fictional cyborgs whose *raison d’être* has been an increase of the organic body’s destructive powers; these are usually figures with potential military or policing applications. Augmenting the capabilities of animals in order to turn them into more efficient weapons of war is a scenario both from the world of science fiction and from actual warfare, though one most often associated with specific species: dogs, horses and—to a lesser extent—elephants (Kistler). In military operations, the strategy of referring to animals participating in warfare as military equipment serves the purpose of legitimating their presence on the battlefield, as Nicole Shukin’s reading of the term “K9” makes clear. Shukin suggests that the abbreviated homophone places the animals “in technological series with other weaponry like the M-16 family of combat rifles or the UH-60 series of Black Hawk helicopters” (Shukin 147–48). Yet, this is not the case here: the pigeon bomb does not terrify. What stands out in this case is the almost complete incompatibility between the goals and public reception: the army’s desire for an effective weapon of mass destruction and the general perception of the project as ridiculous.

If anything, both at the time when the project was operative and at the time of the story’s release to the public, in 1959, the images of pigeons in the bomb apparatus elicited only chuckles and laughter. The behaviorist tendency to ignore species specificity, with the assumption that all organisms are capable of reliable performance when trained using operant techniques, backfired, as neither the potential funders nor the general public shared these assumptions. This became painfully clear in the media

coverage of Skinner's discussion of the army's and navy's work with pigeons after the projects' declassification. Skinner first spoke about the project in a significant setting, where he knew media would be present: at a conference of the American Psychological Association, where he was being recognized with a special award (Capshew 856). The media indeed took note, and newspaper headlines played with every possible pun using the term "bird brain," mercilessly blasting Skinner's ideas. Titles of the popular press articles from September 1959 included: "Bird Brain Guidance Offered for Missiles," "Pigeon to Guide a Missile? Idea is a Bit Misguided," "Birds to Steer Guided Missiles? Navy Finally Pigeon-Holes Idea" (Skinner, *B.F. Skinner Papers Collection*, HUGFP 60.75, Box 2). While reliability of the organic element of the weapon was, to a certain extent, also a concern of the popular narratives, a more obvious one was the questioning of the military potential not of the organic in general, but of the pigeon in particular.

It should be added that pigeons had been extensively used in the war apparatus before Skinner's project. Homing pigeons had been deployed to carry messages since antiquity and after their successful performance in World War II, thirty-two British pigeons were recognized with the Dickin Medal (Allen 118). The US, at the time of World War II, also operated a homing pigeon training facility and, at the peak of its wartime activity, the US armed forces had 54,000 messenger pigeons (Allen 117). In other words, not only had pigeons been successfully used in military operations, their performance had been interpreted as valiant, to allude to the title of Disney's 2005 animated production about a messenger pigeon. Therefore, species alone could not account for the ridicule generated by Project Pigeon. Pigeons could be perceived as heroic, just somehow not suicide pigeons guiding missiles.⁸

One possible factor explaining this discrepancy—i.e. the situation in which messenger pigeons can be, and have been, viewed as heroic, while kamikaze pigeons evoke ridicule and disbelief—may have to do with the perception of instinctive behavior versus acquired behavior in animals. The behavior of homing pigeons is seen as largely instinctive, though it is an instinct that can be harnessed and molded to suit human needs. It is seen as being in the birds' nature to want to return home; the training involved in preparing such birds for wartime action is seen as based on strengthening instincts which are already hardwired into the animal. The perception of instinctive behavior as valorous is even more visible in the case of dogs used by the military: the training of "K9s" is seen as tapping into the dog's "natural" desire to cooperate with the human; and an equally "natural" capability for bravery and sacrifice. The "naturalness" of these tendencies is, of course, hardly ever questioned in the resulting narratives, even though it has been heavily ingrained in humans' perception of their relationships with dogs through purely cultural measures in the form of countless feel-good stories about canine heroism.

⁸ It should be added at this point that many armies have attempted to weaponize unusual species of animals in different ways. During the Cold War the US Army financed projects related to the use of, e.g. disease-infected fleas and mosquitoes as biological weapons. Similarly, to the pigeon bomb, these stories are usually told using the narrative of the military "cabinet of curiosities": a framework that does not really probe the significance of these efforts, but merely lists them as oddities of the past. A fascinating exception is Jacob Hamblin's *Arming Mother Nature*, in which the author writes these attempts into the narrative of the "total war," a concept that Hamblin sees as allowing potential of atrocities even greater than those committed in World War II.

The ease of enlisting canines in nation-building strategies has been thoroughly analyzed by historians and cultural studies scholars (Hediger; Glenney Boggs; Diamond-Lenow; Shukin). However, an observation that may be useful for conceptualizing differences in the perception of homing pigeons (seen to be acting on the basis of an instinct, but a sublimated form of instinct) versus suicide pigeons (seen to be acting against the basic instinct of self-preservation) comes from a text not on war dogs, but from one about a famous homecoming story, Erica Fudge's analysis of *Lassie Come-Home*. In *Pets*, Fudge tries to make sense of the power this sentimental story continues to have over the human imagination and concludes that its potency results from Knight's skillful blending of two potentially contradictory explanations about the human-animal relationship: on the one hand, Lassie's arduous journey to be with her humans makes her almost overcome her status as animal (makes her capable of being seen as possessing qualities ascribed to humans); on the other, the dog's return "is all the more natural and timeless because the return belongs with nature (the animal, instinct) and not with culture (human, reason)" (Fudge 28). Strangely, Lassie transcends nature by yielding to instinct. The same mechanism can be seen at work in the messenger pigeon stories: the birds manage to achieve the status of heroes by yielding to the mysterious homing instinct, by doing what they have been (slightly mysteriously) bred to do through the process of domestication.

Nothing like this is at work in the reception of the bomber pigeon narrative, where the animal is maybe not a terror-evoking monster, but a ridicule-generating freak committing something of a crime against "nature." The bird is seen as performing a behavior that comes purely from the repertoire of "culture": a behavior that it has been taught to do. The fact that the behavior leads to the bird's self-destruction strengthens the perception of the activity not as an expression of avian intelligence, but the exact opposite—proof of "bird brain" stupidity. A similar contradiction has often been at work in various narratives of dog training, where canines engaged in activities they have been bred to perform (i.e. a hunting dog flushing out a bird) are seen as graceful and noble, while the performance of activities that seem unrelated to the semi-teleological explanation of the dog's purpose are seen as freakish and undignified, i.e. hunting dogs performing tricks (Włodarczyk 46–51). In some contexts, a trained dog has been seen as exhibiting intelligence, while in others receptiveness to training is nothing more but an expression of blind obedience, the opposite of intelligence.

Complete information about the training techniques was not part of the story's full press release in 1959, but the papers did say that the birds were rewarded with corn: a supposedly insignificant tidbit of information that does, however, have impact on the general perception of the birds' mission. Using food rewards in animal training (especially dog training) has been quite contentious and, historically, methods based on food rewards have been perceived as a form of bribery and deemed incompatible with tasks seen as tied to performing one's duties; one reason why the uniformed professions were initially reluctant in adopting operant conditioning (Włodarczyk 90–95). The methods are also significant in light of my proposed plan of using behaviorism against the grain and as a strategy of defamiliarization. Firstly, the behavior chosen as the primary method for guiding the missile was the bird's pecking at an image of the target (while being placed inside the apparatus, of course). This

means that the entire endeavor was based on acknowledgment of the bird's ability to recognize the target by sight alone (an ability absolutely not unique to all non-human animals, one which would not necessarily have the best chances of success with, for example, a canine subject). Secondly, pecking is one of the most common behaviors in the pigeon's ethological repertoire, a fact emphasized by Skinner on the first page of his 1944 report on the progress of the project submitted to the sponsor, General Mills: "The response is one of the commonest in the natural repertoire of the bird, and is closely related to hunger, which is used as motivation. Hence, it is possible to reach a very high probability of response" (Skinner, *B.F. Skinner Papers*, HUGFP 60.50, Box 2). In other words, despite the accusations of radical behaviorism's disregard for species specificity, Skinner was well aware that the animal's ethological repertoire of behavior patterns was a proper starting point for teaching behaviors that were to be reliable and maintainable over a longer period of time. In this case, at least, the denial of nature so often attributed to behaviorism is a gross oversimplification.

Thirdly, and most importantly, the conditioning regimen employed with the birds was based on Skinner's trademark application of operant conditioning, roughly understood as strengthening or extinguishing a behavior by utilizing environmental consequences. Here, the pecking behavior was strengthened through the application of specific schedules of reinforcement; i.e. the birds were rewarded with food for increasing their speed of pecking at the target and maintaining the pecking behavior over a longer period of time. It is clear that the birds were not physically punished at any point of the training process. They were carefully and methodically accustomed to being inside the apparatus; they were conditioned via positive reinforcement to peck at the image of a target and were later asked to peck while inside the apparatus, their pecking being additionally strengthened through applications of reinforcement schedules discussed by Skinner both in the partial and in the final reports. Clearly, as is obvious from the sheer number of pages devoted to these issues in the reports, the most interesting part of the training process for Skinner was fine-tuning the reinforcement schedules.

To sum up, it is safe to say that direct compulsion and physical pain were never experienced by the birds and the only negative consequences for the subjects that did not live up to the standards of the experiments were that they were excluded from the project. This conclusion, of course, makes sense only if we equate compulsion with physical pain, which Skinner indeed did. Understandably, it does not make sense once we think of the birds' well-being in a broader perspective. That said, Skinner was not ignorant of the fact that the birds were being used, their instincts manipulated to suit the needs of humans. In the 1959 APA speech, Skinner openly says: "The lower organism is not used because it is more sensitive than man—after all, the kamikaze did very well—but because it is readily expendable" (Skinner, "Pigeons in a Pelican" 28). However, regardless of which perspective one assumes, it cannot be contested that not only was Skinner able to make pigeons peck reliably and continuously for extended periods of time, the birds performed the behavior with vigor and apparent pleasure. The birds, quite obviously, were not aware of the end they were to meet once they completed their task during the actual mission.

More recently, the training procedures developed by Skinner, the very ones employed with the pigeons in "Project Pigeon," have been used with great success

in the training of, for example, military dogs. Dogs had also been employed in U.S. military operations during World War II, so at the same time when Skinner was working on the pigeon-guided bombs, but their training was not carried out using protocols based exclusively on positive reinforcement. In fact, a preliminary mine detection dog training program established by the U.S. Army during World War II failed primarily because of inadequate training methods. The dogs were mostly trained using aversion: an electric shock was delivered to the dog when it came into contact with a mine or a trip wire. As Michael Lemisch writes: “This simple technique taught the dog that anything buried in the ground was suspicious by its very nature and could hurt him” (93–94). Unfortunately for the army, the results of such training proved absolutely unreliable.

This is why the training of contemporary mine detection dogs is a good analogy for the training of pigeon suicide bombers. Mine detection dogs (MDDs), since the beginnings of their utilization for humanitarian-relief efforts in the early 1990s, have been trained using Skinnerian-inspired methods (Fjellanger, Andersen and MacLean). The conceptual framework of training MDDs is not much different from the training of Skinner's pigeons: it is based on recognition of a species-specific acuity of one of the senses (smell, in this case), which is further refined through a rigidly implemented training protocol that teaches the animal to recognize and mark a particular scent (similarly to teaching the bird to recognize by sight and mark by pecking a particular shape) through a carefully crafted training regimen utilizing only positive reinforcement. The final task also carries with it some risk to the canine's life. Of course, the risk is not equal to the total expendability of the life of the suicide bomber pigeon, but the possibility of death is always in the background of a minesweeping dog, though here it would be associated with a mistake in the animal's work, not with a correct performance.

If we use behaviorism not only as a training protocol, but as a framework for evaluating the performance of an animal subject, the actions of a minesweeping dog and of a pigeon suicide bomber are almost exactly the same: in both scenarios the animals have been taught through the use of positive reinforcement to perform highly intricate behaviors, which originate, in both cases, in their species-specific ethological repertoires that have been fine-tuned to suit human needs through the process of training. Most importantly, in both cases the animals are confidently performing the task (most likely, with a high level of enjoyment) because of the utilization of reward-based training. Both the pigeon and the dog are happy to engage in these risky behaviors because of the history of reinforcement associated with them. Not because they wish to sacrifice their lives for the greater good or because they are unusually smart.

Conclusion

Behaviorism's reading of animal (and human) behavior is rooted in so-called “Morgan's canon”: the assumption that if a behavior can be fairly interpreted using mental processes that stand lower on the scale of psychological evolution and development, then one should not turn to higher processes (Valsiner 151–52). Even if the gist of contemporary ethology and animal psychology has recently turned in the direction of proving the

existence of higher mental processes in non-human animals—and while it is clear that Morgan’s canon is absolutely not an exhaustive explanation of all behaviors—the canon’s possible application for the interpretation of the behavior of kamikaze pigeons and mine detection dogs still holds certain explanatory potential, precisely because of its current power of defamiliarization. The pigeon story defamiliarizes the classic “war hero” narrative, but as it does so it paints itself into a corner by breaking convention and producing an unusual story that is not readily accepted by the public. While the breaking of storytelling conventions may be a trademark of experimental art, it is not a useful strategy for securing funding or generating public support. Hardly anyone, maybe with the exception of animal trainers, considers the actions of military dogs purely in non-mentalist terms: as correct (or potentially incorrect) performances of behaviors inculcated through training protocols. The public sphere has become so inundated with stories of canine heroism and bravery that higher mental states become the vocabulary of choice for discussing war dogs, as evident from the titles of media stories and even historical accounts of animals and war. After all, Michael Lemisch’s *War Dogs*, the book from which I recalled the failure of the first mine detection training operation, the one based on teaching the dogs through avoidance of electric shock, is subtitled *A History of Loyalty and Heroism*.

If one strategically accepts the behaviorist reading, the one which does away with the heroism and sacrifice (of both bird and canine), it becomes painfully clear that one of the major reasons for incorporating non-humans into the war apparatus is the greater expendability of non-human life. This, I argue, might be one of the final reasons explaining the public’s negative reaction to the pigeon bomb specifically, and to behaviorism more generally. In the case of military canines or horses, the public’s explanatory narratives focus on the animals’ potential for higher emotions: heroism, loyalty, sacrifice. In the case of the kamikaze pigeons, they do not. As previously argued, they also cannot focus on instinct, as the birds’ behavior is seen as contrary to instinct, as purely acquired, even though its level of “artificiality” is actually similar to the marking of the mine detection dog. In the case of the pigeon bomb, the public is forced to take Skinner’s very open and honest explanation—that is, that the lower organism is used because it is easily expendable—at face value. And somehow, this explanation does not hold potential for the kind of war stories the public needs to maintain morale.

There is, of course, additional disbelief evoked by the effectiveness of the training technology itself: the possibility of not just coercing an animal into performing a behavior that contravenes its well-being, but of the animal engaging in it willingly and with enjoyment. Behaviorism’s ease of crossing species-boundaries, its mantra of “all organisms learn according to the same principles” suggests the scary possibility that the technology could be applied to human beings as well. This accusation of “brainwashing” is one which has been regularly meted out at Skinner in the scores of critiques of behaviorism. Skinner may have disregarded species specificity in favor of universalism, but the public could not accept this claim at face value. Accepting the behaviorist readings of both animal and human behavior required a radical departure from the safety of traditional explanations. Behaviorism forced new interpretations on well-known processes; interpretations that often countered the longstanding

explanatory narratives of both animal and human behavior. It scraped off the thick layer of symbol and myth (here: heroism and sacrifice), leaving only the bare bones framework that, supposedly, was the same across species boundaries. And if it was, if behaviorism's cross-species analogies had any validity, then "Project Pigeon" was more frightening than the scariest horror movie: it not only suggested that a "cruel optimism" (Berlant) scenario – i.e. a situation in which subjects can actively desire something that is detrimental to their well-being—was possible but also provided very specific tools for bringing that scenario to fruition. In that case, the ridicule the kamikaze pigeons met with was understandable: it was the only possible response that downplayed the dangers of technologies of social control.

Works Cited

- Allen, Barbara. *Pigeon*. Reaktion, 2009.
- Berlant, Lauren. *Cruel Optimism*. Duke UP, 2011.
- Capshew, James H. "Engineering Behavior: Project Pigeon, World War II, and the Conditioning of B.F. Skinner." *Technology and Culture*, vol. 34, no. 4, 1993, pp. 835–57.
- Chomsky, Noam. "Review of Verbal Behavior." *Language*, vol. 35, no. 1, 1959, pp. 26–58.
- Deleuze, Gilles, and Felix Guattari. *A Thousand Plateaus: Capitalism and Schizophrenia*. Translated by Brian Massumi, U of Minnesota P, 1987.
- Diamond-Lenow, Chloe. "US Military Nationalism and the Intimate Public Sphere: The Role of the Dog in US Militarism." *Journal of Intercultural Studies*, 2019, pp. 1–16.
- Fjellanger, R.; Andersen, E.K.; MacLean, Ian G. "A Training Program for Filter-Search Mine Detection Dogs." *International Journal of Comparative Psychology*, vol. 15, 2002, pp. 278–87.
- Fudge, Erica. *Pets*. Routledge, 2008.
- Gere, Cathy. *Pain, Pleasure and the Greater Good: From the Panopticon to the Skinner Box and Beyond*. U of Chicago P, 2017.
- Glenney Boggs, Colleen. *Animalia Americana: Animal Representations and Biopolitical Subjectivity*. Columbia UP, 2013.
- Guerrini, Anita. *Experimenting with Humans and Animals: From Galen to Animal Rights*. Johns Hopkins UP, 2003.
- Hamblin, Jacob Darwin. *Arming Mother Nature: The Birth of Catastrophic Environmentalism*. Oxford UP, 2013.
- Haraway, Donna. *Companion Species Manifesto: Dogs, People and Significant Otherness*. Prickly Paradigm Press, 2003.
- Hayles, N. Katherine. *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*. U of Chicago P, 1999.
- Hediger, Ryan. "Animals and War: Introduction." *Animals and War: Stories of Europe and North America*, edited by Ryan Hediger, Brill, 2012, pp. 1–27.
- Kistler, John M. *War Elephants*. Praeger, 2006.
- Koestler, Arthur. *The Ghost in the Machine*. Macmillan, 1967.

- Lemish, Michael G. *War Dogs: A History of Loyalty and Heroism*. Brassey's, 1999.
- Lockwood, Jeffrey A. "Insects and Weapons of War, Terror and Torture." *Annual Review of Entomology*, vol. 57, 2012, pp. 205–27.
- Pinker, Steven. *The Blank Slate: The Modern Denial of Human Nature*. Penguin, 2003.
- Richelle, Marc N. *B.F. Skinner: A Reappraisal*. 2nd ed., Routledge, 2016.
- Shukin, Nicole. "Security Bonds: On Feeling Power and the Fiction of an Animal Governmentality." *English Studies in Canada*, vol. 39, no. 1, 2013, pp. 177–98.
- Skinner, B. F. "Pigeons in a Pelican." *American Psychologist*, vol. 15, no. 1, 1960, pp. 28–37.
- . *The Shaping of a Behaviorist*. Alfred A. Knopf, 1979.
- Teixeira Pinto, Ana. "The Pigeon in the Machine: The Concept of Control in Behaviorism and Cybernetics." *Manifesta Journal*, vol. 18, 2015, pp. 65–73.
<https://www.manifestajournal.org/issues/situation-never-leaves-our-waking-thoughts-long/pigeon-machine-concept-control-behaviourism#>.
- Valsiner, Jaan. "Comparative Methodology as the Human Condition: Conwy Lloyd Morgan and the Use of Animal Models in Science." *Striving for the Whole: Creating Theoretical Syntheses*, edited by Rainer Diriwachter and Jaan Valsiner, Transaction Publishers, 2008, pp. 151–61.
- Włodarczyk, Justyna. *Genealogy of Obedience: Reading North American Dog Training Literature, 1850s-2000s*. Brill, 2018.