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BEING A GOOD SCIENTIST, A GOOD MENTOR AND A GOOD PERSON: HOW TO RUN A LABORATORY THE LATTAL WAY

CÓMO SER UN BUEN CIENTÍFICO, UN BUEN MENTOR Y UNA BUENA PERSONA: CÓMO DIRIGIR UN LABORATORIO AL ESTILO LATTAL

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Resumen

El Laboratorio de Condicionamiento Operante de Andy Lattal en la Universidad de West Virginia es un entorno de aprendizaje cuidadosamente diseñado donde los estudiantes se convierten en analistas de la conducta. Andy ha aplicado su profundo conocimiento de los principios de la conducta para establecer y mantener el comportamiento esperado de buenos científicos dentro de un entorno armonioso, logrado a través de su magistral uso del reforzamiento positivo y su reticencia a emplear el castigo o la coerción. Estas prácticas se alinean con aquellas utilizadas en la gestión del comportamiento organizacional y pueden servir como modelo para otros laboratorios. Este trabajo extrae algunos de los principios que Andy usa en su laboratorio y proporciona ejemplos que se espera sirvan de inspiración a los líderes de laboratorio interesados en eliminar contingencias aversivas y crear entornos de aprendizaje armoniosos y colaborativos. El trabajo incluye un analisis del argumento de Skinner sobre lo que constituye lo "bueno" para aclarar el comportamiento de un buen científico, un buen mentor y una buena persona.

Palabras clave: enseñanza en el posgrado, supervisión de estudiantes, programa doctoral, reforzamiento positivo, gestión de entornos académicos

Abstract

The Andy Lattal Operant Conditioning Laboratory at West Virginia University is a carefully designed learning environment where students become behavior analysts. Andy has applied his deep knowledge of behavioral principles to establish and maintain the expected behavior of good scientists within a harmonious environment, achieved through his masterful use of positive reinforcement and his reluctance to use punishment or coercion. These practices

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align with those used in organizational behavior management and can serve as a model for other laboratories. This paper extracts some principles that Andy uses in his laboratory and provides examples aimed at inspiring laboratory leaders seeking to eliminate aversive contingencies and foster harmonious and collaborative learning environments. The paper includes an analysis of Skinner's views on what constitutes "good" to clarify the behavior of a good scientist, a good mentor, and a good person.

Keywords: graduate teaching, supervising students, doctoral program, positive reinforcement, management in academic settings

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Running a successful laboratory can be daunting task for laboratory heads. Unless our moral compass is broken, we hope to contribute to our science, conduct as many publishable experiments as possible, and teach and graduate a reasonable number of brilliant students. We care about being esteemed by colleagues and students, and we strive to produce positive changes in their lives. We also wish to take care of and spend quality time with our families, friends, and others in our lives. In summary, we aspire to be deemed good scientists, good mentors, and, in general, good people.

There is, however, no manual for achieving these goals. Skinner (1938) played a central role in modeling the standards of good scientific practices in our discipline and Sidman (1960) helped to formalize them. Sidman outlined the rationale and the methods that lead to systematic, reliable, and general behavioral data of individual subjects. These methods are still relevant in an era when the pressure to publish in a timely manner could easily drive researchers away from our foundation: the intensive study of the behavior of individuals in relation to the environment and the description of orderly relations in the data.

Regarding the design of programs to supervise students there are some precedents in behavioral sciences. One interesting example is the supervisory system designed by Dillon and Malott (1981). They created a program with weekly tasks that included attending individual meetings, reading two articles, presenting new data, and other related activities, such as spending 6 to 12 hours in the lab and writing or rewriting 1000 words. This system resulted in a higher percentage of graduate students completing their programs compared to traditional approaches and was described by students as helpful to their progress. There is, however, no indication of how to interact with students to promote these practices or how to create a harmonious environment conducive to a successful research and training program. Other researchers have developed laboratory manuals with precise rules describing the appropriate and inappropriate behavior in the lab (e.g., Aly, 2018). While these manuals can be useful for some, the use of rules

does not guarantee that the students' behavior will contact relevant contingencies (see e.g., Daniels, 2000). Furthermore, there are no recommendations on how to establish and maintain what is considered appropriate behavior in the laboratory (i.e., behavior observed in good scientists) or how to eliminate undesired behavior (e.g., behavior that interferes with learning opportunities or disrupts a harmonious environment).

The Andy Lattal Operant Conditioning Laboratory at West Virginia University has a supervisory system grounded in behavioral principles that not only structures students' academic and research tasks but also promotes desirable professional behaviors and minimizes counterproductive actions in the laboratory setting. The purpose of the present paper is to extract some principles and strategies that Andy Lattal uses to interact with students in ways that establish effective contingencies, and promote a collaborative, productive and supportive laboratory culture. These practices align with those used in organizational behavior management. By identifying the behavioral contingencies and supervisory practices embedded in Andy's framework, this paper aims to offer practical recommendations for supervisors seeking to cultivate an environment conducive to both scientific training and professional development.

On Being "Good"

A starting point that poses a difficulty is how we define "good" (see also Jarmolowicz & Escobar, 2023). More specifically, what does it mean to say that someone is a good scientist, a good mentor, or a good person? As many readers of this journal are aware, "good" cannot be defined as a quality inside the individual, but rather in terms of behavior and its effects on the environment. Skinner (1971) argued that, compared to other natural sciences, the behavioral sciences are in a particularly advantageous position to describe what is good (see also Hocutt, 1977, 2009). The foundation of Skinner's analysis is that good things are positive reinforcers. These can be identified as such in three levels: reinforcement of the speaker's behavior, reinforcement of the behavior of others, and reinforcement of cultural practices. People's descriptions of what is good results from identifying stimuli that, due to our reinforcement and evolutionary history, function as reinforcers and impact the behavior in these three levels (see also Baum, 2017; Rottschaefer, 1980). It is important to note that "good things" are positive reinforcers, but not all positive reinforcers are "good things". From a behavioral perspective, what is "good" is specifically associated with long-term reinforcement relations, as opposed to short- term reinforcement. For instance, drugs and unhealthy foods may function

as potent reinforcers, but only in the short term; they may lead to major punishment in the long term. Such a situation, in which people sacrifice long-term welfare (e.g., good health) for short-term gain may be called a "reinforcement trap" (Baum, 2017) and can be described as a "bad thing".

"If pursuing worldly pleasure is bad, then what is good? Answers vary, but they generally advocate values like kindness and simplicity. Help others even at your own discomfort. Eat to live instead of living to eat. Give up selfishness and excess. From a behavioral perspective, such injunctions point to deferred aversive consequences. Selfishness and high living may pay off in the short run, but in the long run, they lead to loneliness, illness, and remorse. In the long run, you'll be happier if you help others and live moderately." (Baum, 2017, pp. 172-173)

At one level, what is good can be judged in terms of the reinforcers maintaining individual behavior. One might say, "I am a good scientist" after publishing numerous papers. Skinner (1971) suggested, however, that good things are also judged in terms of what is good for others. People judge an individual's behavior as good when it provides reinforcement not only for the individual's behavior but also for the behavior of others. For example, at one level, one could say "I am a good mentor because I have graduated many students" —an achievement that can be interpreted as producing powerful reinforcers for the academic's behavior. Yet, it is crucial to ask whether the actions are also interpreted as good for others. Did my behavior produce long-term reinforcement for the students' behavior?

Identifying what is good for others is a complex task. Although not always immediately apparent, many rewards that produce larger, long-term effects are often valued more highly than immediate rewards with smaller, short-term effects (see e.g., Odum, 2011). Many authors, including philosophers and poets, have written extensively on what it means to do good for others, which in behavior analytic terms, translates to identifying what produces more reinforcers in the long run for others' behavior. Analyzing these views in depth would be a monumental task, beyond the scope of this paper. As an example, however, Mayeroff's (1971) book *On caring* makes the straightforward argument that caring for another person is to help them grow and actualize themselves. This idea aligns with Skinner's view and can be interpreted as helping others to obtain large, long-term rewards. For Mayeroff, "caring is the antithesis of simply using the other person to satisfy one's own needs" (p. 1). He also noted:

"To help another person grow is at least to help him to care for something or someone apart from himself and it involves encouraging

and assisting him to find and create areas of his own in which he is able to care. Also, it is to help that other person to come to care for himself, and by becoming responsive to his own need to care to become responsible for his own life" (p. 7).

Mayeroff's view certainly expands what it means to produce unselfishly valuable reinforcers for the behavior of others, which is the second level of "goodness" in Skinner's (1971) view.

Skinner (1971) went on to specify that, to judge something as good, we must also consider what is good for the culture. Skinner suggested that rules and norms are created based on what is "good for the culture" (p. 144). Skinner (1969) had previously defined culture in terms of the contingencies acting on a group of individuals. As such, these contingencies are shared and maintained by the members of the group who, through a particular history of reinforcement, have been taught to transmit them to other members. It can be said that practices prevail because they promote cultural survival. As Hayes and Tarbox (2007) stated "Skinner adopted survival as the absolute standard of goodness in his system" (p.706). When asked why anyone should be concerned with the survival of a culture, Skinner replied pragmatically: "There is no good reason why you should be concerned, but if your culture has not convinced you that there is, so much the worse for your culture." (p. 137).

Following Skinner's analysis, we consider the survival of behavior analysis as the third level in our definition of goodness concerning being a good scientist and a good mentor in our field. Consequently, we should ask: Am I training students who will contribute to the survival of our field? Without this continuous process of training, behavior analysis would eventually fade. Am I publishing papers that will contribute to the survival of behavior analysis as a scientific discipline? We may also add that Skinner was right, as many of us are already convinced of the need to ensure the survival of behavior analysis for numerous reasons that exceed the scope of this paper (see e.g., Skinner, 1987).

Once we have a working definition of "good," we may proceed with our analysis of the behavior of a good scientist and a good mentor, and then delineate a few guidelines that could be useful for current or future laboratory heads. Our guidelines are based on our observations (which admittedly occurred over a limited period of two years) of what we consider the best available example: Andy Lattal's Operant Conditioning Laboratory. We must confess that we are far from claiming to be experts in how to manage a laboratory. We acknowledge that all we know in this regard is based on Andy's comments on these topics (e.g., Lattal, 2005), our experiences facing the consequences of

making mistakes with our students in our laboratory, and our observations of different strategies employed by academics directing laboratories. These strategies involved using either positive reinforcement contingencies or aversive control of behavior, which led to diametrically different outcomes for those involved, both in the short term and in the long run.

Having seen the devastating effects of aversive contingencies in the lives, relationships, and careers of many promising students we felt that we could contribute to the field if at least one laboratory leader, at one point, replaces one aversive contingency with one based on positive reinforcement. Of course, the best outcomes occur when a laboratory leader arranges positive reinforcement for desirable behavior and supports long-term reinforcement relations, or as we now call it, when a leader follows the Lattal way.

We acknowledge that this manuscript should have been written by Andy Lattal, not by us. In many cases we had to speculate about Andy's techniques and the reasons why he does things the way he does. We can only hope to prompt a reply by Andy correcting any misunderstandings on our part.

Being a Good Scientist

The publication of the classic study by Mead and Metraux (1957) produced an illustrative idea of what the image of a good scientist is, at least from the perspective of high-school students:

> … He is interested in his work and takes it seriously. He is careful, patient, devoted, courageous, open minded. He knows his subject. He records his experiments carefully, does not jump to conclusions, and stands up for his ideas even when attacked…. He is prepared to work for years without getting results and face the possibility of failure without discouragement; he will try again. He wants to know the answer… He is a dedicated man who works not for money or fame or self-glory… but for the benefit of mankind and the welfare of his country. (p. 387)

Setting aside the sexist language and approach to scientific work that were customary in the 1950s, there are some interesting attributes in this image. Some relate to our interest in our subject matter as scientists, others to our knowledge of our science, and still others to our contribution to knowledge. Interestingly, the emphasis on behaving for the good of others and the good of the culture is also included in this image.

As noted previously, Sidman (1960) provided examples of what constitutes behavioral data that is good for others and for the field. It is difficult to go wrong if we adhere to the rationale behind Sidman's

thorough examples. The emphasis on curiosity, obtaining orderly data, the reasons for conducting experiments, and the notions of reliability, replicability, and generality are crucial for making a significant contribution to our field. There is a difference, however, between reading and understanding Sidman's book and truly using it to guide our scientific practices. As a rule of thumb, following Skinner's lead, if we focus on the idea that experiments should produce data that are good for us, for others, and for the field, we are in a better position to judge what a good scientist does, and how to run a successful research program.

After working on a research question, sometimes for years, it can be relatively easy to lose sight of the fact that data must be good not only for us, but also for the society and for our field. One of the "demons" researchers face is overconfidence in the importance of their own research. It is easy to transgress this principle and forget that having orderly data does not guarantee publication. Even worse, this overconfidence could lead researchers to force data to fit an interpretation instead of allowing the data to lead the way, as outlined by Skinner (1956) and Sidman (1960). To be helpful and useful for the field, data and their interpretation must make sense in relation to established principles of behavior; as Baer, Wolf, and Risley (1968) precisely stated, it has to be conceptually systematic. The peer-review system is, at least ideally, designed to evaluate whether our procedures, data, and interpretations of the data are good for others and for the field, and it must be valued as such (see e.g., Gannon, 2001). Returning to the main argument, a good scientist "plays with others and plays by the rules."

Andy Lattal certainly fits the image of a good scientist. It would be impossible, of course, to describe each of his many contributions to our field in this paper. Andy has authored more than 140 book chapters and articles, which are published in major journals of our discipline. As the audience familiar with the behavior analytic literature knows, Andy has worked on a variety of crucial topics in behavior analysis and has contributed significantly to many areas of our scientific discipline, including conceptual issues in behavior analysis, the history of behavior analysis, the experimental analysis of behavior, and applied behavior analysis. His publications have been cited over 6,600 times.

A Good and Trusted Disseminator

Besides Andy's many contributions to behavior analysis through effective dissemination of his research, he has devoted other significant efforts toward the worldwide growth of our discipline. Dissemination

of behavior analysis relies on trust between the disseminator and the audience, and "effective dissemination is a matter of effective behavior to motivate, teach, or signal the effective behavior of the consumer" (Flynn et al., 2023, p. 25). Andy is a trusted disseminator worldwide not only because he is a good scientist, but also because he is sensitive to what is needed in different regions and how to approach and communicate effectively with people from different cultures. Thanks to his disseminating efforts he has carried behavior analysis forward to other cultures, facilitating the long-term growth of our field. As Elcoro (2023) clearly expressed, Andy's laboratory is known for its ethnic and cultural diversity, attracting students from a wide range of backgrounds. We share Mirari Elcoro's impression: Andy always shows a genuine interest in learning about his students' cultural backgrounds. With this respect and interest in other cultures, as well as his profound commitment to the growth and survival of our discipline, Andy has established educational and research programs in behavior analysis internationally.

Regarding his many contributions to behavior analysis in Mexico, Andy has welcomed many students from our country into his lab. He has given numerous conferences in Mexico disseminating his research, inspiring new research, and inspiring our students. He served as Editor for English-language submissions for MJBA during three four-year terms. The first time he served in this capacity was during Carlos Bruner's appointment as Editor. Carlos Bruner initiated a collaboration and friendship with Andy. Thanks to this relationship, three of Carlos' former students, including us, had the opportunity to visit and learn from Andy and to begin our own collaborations with him. Andy's work, support, and advice were crucial during our tenures as editors of MJBA. Additionally, Andy served as guest editor for three special issues of MJBA, which have been widely cited. He has contributed enormously to maintaining the scientific quality of the journal and to disseminating MJBA on a global scale. For his many contributions to the dissemination of behavior analysis, Andy received the *Award for the International Dissemination of Behavior Analysis* from the *Society for the Advancement of Behavior Analysis* in 2016.

Being a Good Mentor

Alan Poling (Poling, 2010) wrote: "Years ago, I was trained in the experimental analysis of behavior (EAB) by Andy Lattal, one of the best behavior analysts and best men I have known. He guided me gently… and [I] emerged as a behavior analyst" (pp. 8-9). Based on personal communications with many of Andy's former students, we know that Dr. Poling's experience is shared by many of them.

Andy drew his teaching and mentoring methods from his own research on techniques for arranging suitable learning environments (Lattal, 2005). Based on our observations, it is notable that Andy's teaching and mentoring completely align with our science. His methods are conceptually systematic. In the following sections, we attempt to describe some of the principles we have observed that are used in laboratories to train students, and how Andy uses or avoids them to create conditions that help students become behavior analysts.

Control by Antecedents

Modeling (It's Not What You Say…It's What You Do)

Modeling is a powerful technique used to occasion desired behavior. Modeling is particularly important if the model is someone considered successful or knowledgeable (Henrich & Broesch, 2011). Being perceived as a good scientist, therefore, is essential for running a successful research and training laboratory. As an outstanding scientist, Andy Lattal is also an outstanding model. As Childers (2006) noted, "to be a leader and get people excited, create good reasons for people to follow you" (p. 3). If we are lucky, we find ourselves with a person who inspires us. If we are exceptionally lucky, we find ourselves with someone who inspires us and guides us (using scientific principles) to emit the target behaviors that bring us closer to where we want to be. Fortunately, many of us have been exceptionally lucky. Being a successful scientist, disseminator, and leader is different from merely saying or pretending that we are. "If you talk a good game, but have no evidence to back it up, you won't be a leader for long… if ever" (Childers, 2006, p. 8). Andy takes the opposite approach: his behavior and the lasting products of his behavior speak for themselves.

Modeling is also important for influencing everyday behavior in the laboratory. It can be useful, for example, if the behavior of an experienced student serves as a model for the behavior of new students. This, however, must be done carefully, as the behavior of experienced students must also be supervised regularly, and care must be taken to avoid having students substitute for the laboratory head. Being present frequently in the laboratory is important to avoid these issues. As described by Antes (2018) "work the shop floor". As she noted, "visibility supports approachability, impromptu brainstorming and immediate troubleshooting"

Many readers of this journal are already familiar with the notion that modeling is a practical and effective technique to prompt behaviors, but only when a series of factors are considered. For example, Miltenberger (2008) noted, among other aspects, that the behavior of the model

should result in a successful outcome (a reinforcer), the model should resemble the people observing the model or have high status, the complexity of the model's behavior should be appropriate to the ability level of the learner, the learner has to pay attention to the model's behavior, and modeled behavior has to occur in the presence of the relevant discriminative stimulus. It is important to note that because modeling is a supplementary antecedent event that occurs during the acquisition phase of instruction, it is expected that stimulus control is soon transferred from the modeling prompt to the relevant discriminative stimuli (Cooper et al., 2017). Moreover, the modeled behavior will only be maintained if it contacts reinforcement in the naturally occurring contingencies. Without considering these aspects, modeling may be ineffective to modify the learner´s behavior.

Rule-governed Behavior

Verbal humans tend to overuse rules to try to modify the behavior of those around them, even when surrounded by non-verbal humans or even non-human animals! For instance, in the dog park, we frequently hear people telling their dogs "Stop pulling your leash, walk beside me! "or "Stop eating grass, you'll get sick!" Regarding the common overuse of language in trying to modify behavior, Andy once mentioned, referring to Kaplan and Maslow, "If all you have is a hammer, everything looks like a nail."

We enunciate the rule and expect behavior to follow. Rules describe environmental contingencies and are certainly an important antecedent event that can be used to accelerate the acquisition of complex behavior and reduce variability compared to exposure to environmental contingencies alone (Skinner, 1989). As such, rules are an important tool for behavior analysts in applied settings. Rules, however, cannot substitute the use of direct contingencies. There is ample research showing that rules can prevent behavior from contacting natural contingencies, to the point that rule-governed behavior can become insensitive to the contingencies (e.g., Fox & Kyonka, 2017; Shimoff, Catania, & Matthews, 1981).

Some rules are useful. We remember Andy climbing on his desk to reach a JEAB issue on the upper shelves to show us an article with data relevant for a particular discussion. "You should take a look at this". That was the rule that was needed to help us find what was interesting for a particular topic. Without further details, we were free to follow the literature depending on what we discovered along the way.

Other rules may seem like a good idea but could easily interfere with appropriate behavior making contact with natural contingencies (cf. Antes, 2018; Dillon & Malott, 1981). For instance, it might have

seemed easier for many of us to have a fixed laboratory schedule. Asking students to be in the laboratory, two hours a day, seven days a week —amounting to 14 hours of lab work— does not sound unreasonable. However, there was no fixed schedule in Andy's lab aside from meetings, seminars, and courses. Without a rule, our behavior came into contact with positive reinforcement contingencies that led us to spend more time in the lab doing research. We also knew that time spent in the lab wasn't what mattered, getting the job done was. We knew we did not have to be in the lab, but we "wanted to."

Establishing and Maintaining Appropriate Behavior

Students, like everyone else, behave in an environment in which various events occur either as a consequence of their responses or independently of them. Approaching others, engaging in conversations, arguing, making jokes, facial or body expressions in the presence of others often result in consequences that alter the probability of future responses. Attention, appreciation, agreement, a smile, and praise — comments like "that's interesting" "good idea" or "well done" — are powerful positive reinforcers for students' behavior, especially when coming from a mentor the student regards as a good scientist. Positive reinforcers are the most powerful tools in the good mentor's arsenal. Extending the argument by A. D. Lattal and Clark (2007), appropriate behavior, defined as that emitted by a good scientist, must be "recognized and reinforced in both subtle and obvious ways" (p. 14).

According to Andy Lattal (Lattal, 2005): "The behavior that we define by 'intellectual or conceptual or thinking skills,' like any other behavior, requires a lot of guidance and direct reinforcement in the beginning, a lot of control by the natural contingencies at the end" (p. 187). Andy takes the time to get to know each of his students —their backgrounds, their interests, their proclivities— and builds upon that foundation. He works closely with his students; tailoring individual goals based on their current behaviors and providing positive reinforcement for each step toward those goals.

One common anecdote among Andy's students is that he uses most interactions as opportunities to learn about the students and reinforce appropriate behavior. When asked about his opinion on any topic related to, or even unrelated to, behavior analysis, his common reply is, "I don't know, what do you think?" Once the student replies, Andy provides the consequence that best suits the occasion. This strategy makes Andy a good mentor and a fantastic person for students to talk to at conferences and academic meetings. Like other "really good people in behavior analysis" (see e.g., Critchfield, 2024), when the first author met Andy as an undergraduate student and when the second

author met him close to finishing her Ph.D, Andy took the time to listen carefully to our ideas and made us think that we had a future in behavior analysis, even when all we had at the time was our enthusiasm for behavior analysis and eagerness to learn more.

Andy uses positive reinforcement to establish numerous crucial behaviors in his students, positively influencing their personal and professional development. This includes "conceptual or thinking skills". Andy mentioned that there are few things quite as rewarding as a student coming to a new level of understanding, this is, students "getting it" (Lattal, 2005). The established behaviors quickly contact the environment in Andy's lab: the students find themselves understanding the literature, formulating research questions, carefully instrumenting an experiment to satisfy their curiosity, watching closely the behavior of their subjects, and sharing and discussing their findings with other members of the lab and the department.

An important consideration when training appropriate responses in students is that people should not compete for positive reinforcement; it should be available to all who earn it. Bringing people together to solve problems increases the opportunities for receiving positive reinforcement (Daniels, 2000). When desirable behavior is under the control of positive reinforcement, people report being free and happy (Baum, 2017)

As suggested by most supervisory systems, Andy scheduled individual weekly meetings with every student. These meetings felt like an amazing opportunity to discuss experiments, behavior analysis, science in general, or just events in life. After a polite greeting, if nothing was proposed by the student, Andy would begin with an encouraging, "What's up?" There was never a rule on what to do in these meetings, but each of us knew exactly what we wanted to do. It was our time (cf. Antes, 2018). Andy maintained an open and flexible environment where a wide variety of topics could be discussed. These included the analysis and interpretation of data, potential research directions discussions about research articles, and career advice. This openness allowed our meetings to be both productive and personally enriching.

Another important step in training is that Andy gradually and gently introduces people to other environments, such as professional meetings and conferences. Responses that were reinforced in a carefully crafted learning environment must get trapped and maintained by natural agents. The confidence, but not arrogance, gained in the weekly meetings and seminars is crucial in this step, as it facilitates the occurrence of responses that will contact contingencies outside the laboratory.

We were fortunate to experience the learning environment that Andy designed, where reinforcement was readily available, where students' ideas, sometimes expressed in a shy and unclear manner, were shaped into good ideas. Students were cooperative and happy. Andy is a person who practices what he professes. In his own words: "Good learning environments also involve openness to ideas. Such ideas seem likely to me to be evoked under circumstances that encourage dialogue and cooperation among students and discourage competition for both resources and professor time" (Lattal, 2005, p. 186). In other words, he talks a good game and has ample evidence to back it up.

Elimination of Inappropriate Behavior

Andy is well known among students for his masterful use of positive reinforcement to shape appropriate behavior in the laboratory. This requires not only knowing exactly when to deliver reinforcement but also when to withhold it. Extinction is a powerful principle that reduces the likelihood of previously reinforced responses. When extinction of inappropriate responses is combined with reinforcement of appropriate responses (i.e., differential reinforcement), inappropriate responses are quickly eliminated and replaced with appropriate behavior.

Extinction, however, must be used carefully. As noted by A.D. Lattal and Clark (2007, p. 226) "it can be perceived as coercive or shameful". A. D. Lattal and Clark also identified many other problems associated with extinction in organizational settings. If extinction is equated with ignoring, it may be embarrassing or unpleasant and could produce negative reactions toward the individual implementing it. Additionally, when applied, for instance, when new ideas are being proposed, it can reduce the generation of ideas over time, which is a valuable behavior in academic settings. We have an example of how extinction was used in Andy's laboratory.

In numerous occasions, probably more than we'd like to admit, we brought to the weekly meeting with Andy an unclear or entirely irrational idea, which at the time, of course, seemed like a fantastic argument. When presented with such an incomprehensible idea, Andy would look at us expressionlessly for a few seconds that felt like an eternity. His gaze seemed like a prompt to say something else, like "Well, maybe I can work on elaborating here and there" or "Maybe this is not a great idea after all, I will continue thinking about this". After this moment of self-reflection, Andy would respond with "well, that part was interesting" or "You did this other thing right." We left the office with a sense of accomplishment even when the original idea did not produce reinforcement. These meetings were a masterclass on differential reinforcement of human behavior.

Avoiding Aversive Control (The Fast Track to Fear, Resentment, Anger, and Aggression)

In our experience, it is not uncommon to see research laboratories that function primarily under aversive control, where the laboratory head reacts only when inappropriate behavior occurs. Furthermore, when students share ideas, some laboratory heads may punish this behavior, perhaps as a way to put students "in their place" as part of a plan to make them "good and wise scientists" (e.g., see the anecdote in Lattal, 2005). Unfortunately, coercive relationships are common because aversive control seems to work for those using it. Individuals are sensitive to potential aversive consequences, such as disapproval or even the threat of disapproval, which is often enough to keep people in line (see Baum, 2017). However, relying on aversive control comes at a high cost and has nasty side effects, such as fear, resentment, anger, and aggression (Baum, 2017; Daniels, 2000).

In these coercive environments, positive reinforcers are obviously scarce or perhaps reserved for a few "privileged" students. Concerning the issues stemming from the lack of positive reinforcers, Daniels (2000) noted:

"When there is too little reinforcement to go around, people will compete with each other to get it. Competition for significant reinforcers…can generate behavior that is incompatible with the team-oriented work environment most organizations are trying to promote. Infrequent reinforcement promotes the kind of "political" behaviors with which we are all familiar: blaming others, covering your rear, and even sabotaging the initiative of others" (p. 75)

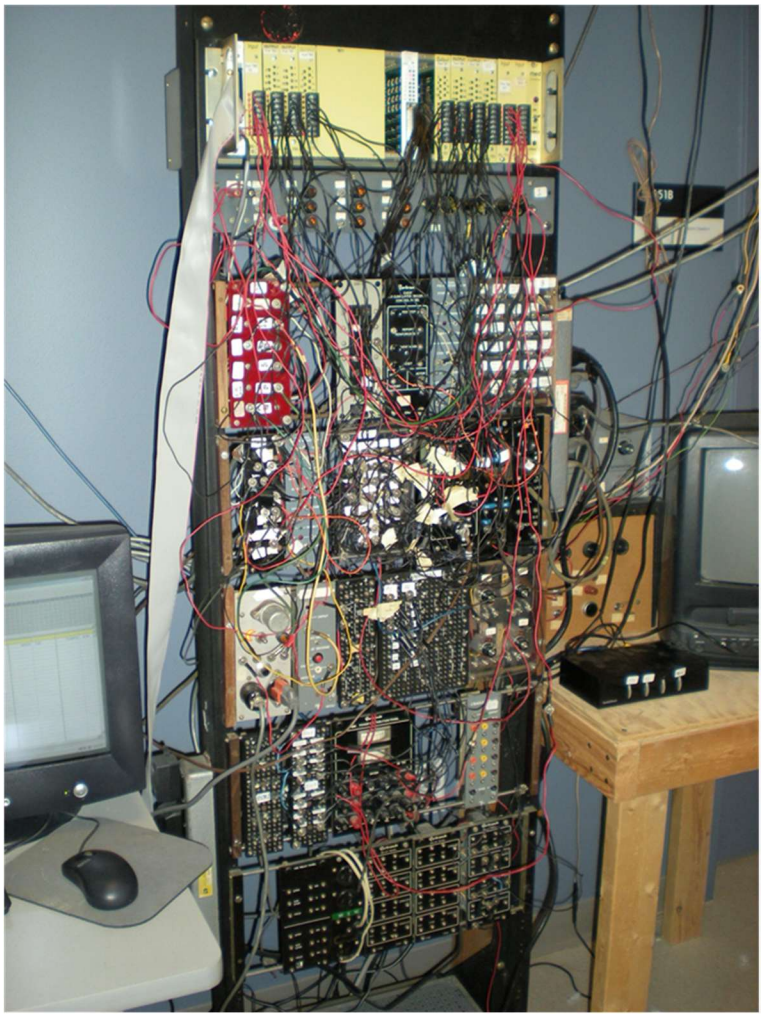
Aversive control makes people unhappy, and the person who is in control may do better through the strategic and predominant use of positive reinforcement (A. D. Lattal & Porritt, 2008).

Occasional corrections followed by a description of the appropriate response that could contact positive reinforcement, as well as clear rules specifying the possible, undesirable, natural aversive consequences for responding in such way, are certainly useful and can be integrated in training programs when needed. Corrections should keep aversive control to a minimum and must never be conducted in public (e.g., Daniels & Bailey, 2014). Corrections must point out problem behavior and describe an alternative appropriate response, it's not about making students pay for their sins.

To avoid misunderstandings, an example is in order. It was well known among students that Andy was particularly ready to energetically correct the behavior of those who messed with the electronic control equipment in the laboratory (Figure 1). The basic rule was "do not touch anything if you don't know what you are doing, ask

Figure 1

One of the Two Hybrid Racks Used in Andy's Laboratory (named Fred and Murray).



Note. The setup combined Med Associates Input and Output Cards with relay boards connected with snap leads.

for help." This rule was critical, as the functioning of the laboratory depended on the equipment. We all knew that one mistake could affect

not only the experiment in question but also the experiments of others. It is important to note that Andy was always ready to help if anything failed or did not go as planned. He could often be found in the laboratory late at night or early in the morning, fixing the equipment and ensuring that it was working perfectly. He established perfect stimulus control. As noted by Daniels (2000) "The most effective work environment is one in which people know when to work alone and when to ask for help" (136). Of course, an important consideration is that if students ask for help, you must be there to provide it unless you want them to find a solution on their own, which in the case of Andy's laboratory equipment it could have disastrous consequences.

Being a Good Person

A. D. Lattal and Clark (2007) wrote:

"Do we have moral integrity? Can people count on us to do what is right? Do we always put our own interests first or do we also look out for the interests of other people? Are we committed to moral principles of rights, helping those in need and looking out for the good of society? Have we thought about these principles and our reasons for following them? Have we thought about what to do when basic moral principles seem to conflict?" (p. 4)

If we think about Andy's behavior, the answer is a resounding "yes!" He is not only a good scientist and a good mentor; he is also a good person. Perhaps the touchstone is that to be a good scientist and a good mentor, you must be first a good person.

We admit that it may be difficult to reach Andy's standard of caring and his masterful use of behavioral principles. He set the bar too high for most of us aspiring to lead a laboratory in such an effective manner. In our case, we have tried our best, but in all truth, we just do not seem to get it right, and we continue to learn. Hopefully, contact with natural contingencies will reinforce successive approximations to being closer to what Andy expected from all his students.

An important disclaimer is that Andy was not responsible for any of the content of this paper, and he may not agree with most of what we wrote. We wrote this manuscript based on our observations, experiences, perceptions during our interactions with Andy, and what some other former students of the Lattal lab told us about their interactions with him. We could be misinterpreting Andy's ideas. As we noted previously, we can only hope to prompt a written or a verbal reply from Andy correcting any misunderstandings on our part, but this may never happen, as Andy would never reinforce inappropriate behavior: that is not the Lattal way (see Figure 2).

Figure 2

Andy Lattal (center) with the authors of this paper in Morgantown, West Virginia, in 2010.

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