



## In Practice: Applications of Contextual Behavioral Science

## Crying babies

Robert Epstein

American Institute for Behavioral Research and Technology, 1035 East Vista Way, Vista, California, United States

## ARTICLE INFO

## Article history:

Received 23 January 2012

Accepted 22 May 2012

## Keywords:

Operant conditioning

Classical conditioning

Crying babies

Parenting

Punishment

Quiet training

## ABSTRACT

Answers to a final-exam question about slapping a crying baby provide a good indication of just how well students understand the difference between classical and operant conditioning. Unfortunately, the author has found that relatively few students in introductory courses on learning or behavior are able to answer this question correctly. This may be true because of how instructors and textbooks teach about operant and classical conditioning, and it may also be true because of the subtle ways in which these procedures overlap. The exam question, which is theoretical, is related to a practical problem that parents of infants face every day: when a baby is crying, should we ignore the crying or pick up and comfort the baby? Although this issue is still debated among parenting experts and although parents rarely behave optimally in this situation, behavior analysis offers a clear and unequivocal solution to the problem.

© 2012 Association for Contextual Behavioral Science. Published by Elsevier Inc. All rights reserved.

## 1. Introduction

After teaching for most of the past 30 years, I have now moved on to other things—mainly work in media. So the time has come to reveal a secret.

Do not get too excited, though; it is not a personal secret. It is the answer to a question I have asked more than 2000 students on final exams I have given in various courses on learning and behavior over the years—the answer to what I call “the crying-baby problem”—a theoretical behavior-analysis problem that I have used as a way of determining whether or not a student really understands the differences between operant and classical conditioning. While professors virtually always reveal the answers to exam questions after an exam, I have made an exception for this particular question. As far as I can recall, I never answered this question in class; I never gave the answer to a student who asked me about it; and I never wrote the correct answer on an exam. Faced with queries from students I have said things such as, “You’ll get it eventually; just keep working on it”. On exams, I have given partial credit and written things such as “You’re on the right track”. On occasion, I have also given full credit for an answer. When that has happened, I supposed I have revealed the answer. But students who “get it” (in both senses) have tended to keep the answer to themselves, as far as I have been able to tell, perhaps following my lead.

While outlining this article, I was reminded almost immediately about a very different crying-baby problem: the practical

problem that parents and other caregivers face when a baby is crying. Just what is one supposed to do: comfort or ignore?

The world is not ready, I suspect, to read two separate articles by me about crying babies, so in this essay I will do my best to present reasonable solutions to both problems, and, toward the end, I will show how they overlap.

## 2. Problem one

## 2.1. Operant or respondent?

Before I present the exam question, let me apologize in advance to readers who can answer it easily. To those readers, along with my apology I offer the following defense:

First, given that you are reading this journal, you are probably a highly skilled and intelligent observer of behavioral phenomena; your knowledge is not necessarily a good gauge of what students know. As you will see, it might not even be a good gauge of what you *think* students know.

Second, although more than 60 percent of the undergraduate students to whom I have given this question have received partial credit for their answers, less than 2 percent have received full credit. Lest you think that this is because I am simply a poor teacher, please consider the fact that only about 5 percent of my A students have aced this question. In other words, even students who can answer relatively straightforward questions about operant and classical conditioning quite well—that is, questions that were already answered (more or less) in lectures and readings—have enormous difficulty extending that knowledge to a problem requiring what I see as a very modest degree of analytical thinking.

E-mail address: [re@aibr.org](mailto:re@aibr.org)

Third, in graduate courses I have taught outside of the behavior-analysis domain—for example, courses on “learning and cognition” for clinical graduate students—my graduate students have not performed much better than my undergraduates: fewer than 1 in 10 have received perfect scores on their answers to this question.

Fourth—and this is disturbing—now and then, usually over a beer, I have posed the question to colleagues who were currently teaching or who used to teach courses on learning or behavior. I have not kept close track of the outcomes, but I would say that more than half of these individuals failed to answer the question correctly. Perhaps it was the beer.

One could argue, of course, that people have trouble with this question simply because it is difficult, but that is just a copout. In my view, if one can not only answer definition-related questions about operant and classical conditioning but also understands the concepts, one should be able to answer this question. And however we may choose to operationalize natural-language terms like “understanding” and “concepts”, it is apparent to me that we truly want our students—and our instructors—to behave accordingly.

Here is the exam question, which was inspired by a problem posed in Catania's (1979, p. 75–76) textbook on learning:

A baby is crying. In an attempt to stop the crying, a caregiver slaps the baby. The baby then cries louder. Again, in an attempt to stop the crying, the caregiver slaps the baby. Once again, the crying gets louder. Eventually, the parent gives up, and, after a while, the baby finally stops crying. Is the crying operant or respondent? Is the slap a reinforcer? If the slap is not a reinforcer, what is it? How would you prove your answer?

Here are examples of the kinds of answers students have given. (For didactic purposes I am streamlining and simplifying actual answers. I have also taken care of the problems with redundancy, grammar, and spelling that are common on in-class exams.)

**Example 1.** The crying is operant. Yes, the slap is a reinforcer. The procedure described in the question provides the proof. A reinforcer is a stimulus that strengthens behavior it follows. The crying was strengthened whenever a slap followed it. It also grew weak (eventually) when the slap stopped coming. This is just like what happens in a Skinner box. A hungry rat's lever-pressing is strengthened when it produces food (reinforcement), and it disappears when food is no longer presented (extinction).

This kind of answer—which, unfortunately, is the most common type (at least in introductory undergraduate courses on learning)—receives no points. It shows only a superficial understanding of the meaning of “operant”. Yes, operant behavior is behavior that is modifiable by its consequences, but the procedure as described does not necessarily show that the crying was being modified by its consequences. The student's answer also misses a subtle part of what should be a complete definition of “reinforcer”. Yes, a stimulus can reasonably be called a reinforcer if it strengthens the behavior it follows but only if the behavior is not increasing in strength *for some other reason*. In this case, it is likely that the behavior is increasing in strength not because the slap followed it but for another reason.

**Example 2.** The crying is operant. Yes, the slap is a reinforcer. We know this because when the crying was followed by the slap, the crying grew stronger, and when the slapping stopped, the crying grew weaker. Although a slap can often serve as a punisher, we know that it's not working that way here, because punishers, by definition, weaken behavior. We can prove that the slap was a

reinforcer by repeating the procedure in other ways that show that the slap performs as reinforcers do. For example, schedules of reinforcement produce distinctive patterns of behavior. If we slapped the baby on a variable-interval (VI) schedule, we would expect the baby to cry at a fairly constant rate. If we slapped on variable-ratio (VR) schedule, we would also expect the baby to cry at a fairly constant rate but also to cry more loudly than under the VI. I think this would occur, because under the VR, the more the baby cried, the sooner it would be slapped again, while under the VI, no matter how hard the baby cried, the slap would only come after some time had passed. It would therefore have more time to calm down.

I might award an answer of this sort 3 points out of a possible 10. It is wrong, but it gives some accurate information about both punishment (at least when punishment is defined by its effects) and schedules of reinforcement. More important, it also offers a plausible sounding defense of the assertion that the slap is a reinforcer. Reinforcers, after all, should produce characteristic patterns of behavior when delivered according to certain schedules. Trying to produce schedule effects might be a good way to test the student's hypothesis. In other words, there is some good thinking here. What is frustrating about the answer is that last sentence, which acknowledges that the baby will “calm down” when not slapped for a while.

**Example 3.** I think that I'm only supposed to pick one type of behavior, but the crying seems to be both respondent and operant. Also, the slap seems to be a reinforcer—because it's strengthening the behavior that it follows—but it also seems to be an unconditioned (also called unconditional) stimulus (UCS). Slapping a baby should make the baby cry, just as tapping a tendon on someone's knee should make the knee jerk. I think the procedure as stated in the question already shows that the slap is a reinforcer. To show that it's also a UCS, we could just wait until the baby has completely stopped crying and then slap it. At this point, the baby will almost certainly start to cry again, which shows that the slap is a UCS.

This kind of question might be awarded 4 or 5 points. The student has recognized a critically important feature of the procedure, namely that the slap not only follows the crying, it also precedes it. The student correctly recognizes that the slap might be a UCS and also proposes a modest procedure for testing this idea. Where the student has gone wrong is in not recognizing that although the procedure superficially resembles an operant conditioning procedure, in fact it is not.

**Example 4.** Although the procedure looks like an operant conditioning procedure, it's really not. The crying is probably respondent (or Pavlovian) behavior—specifically an unconditioned (also called unconditional) response (UCR), and the slap is probably a UCS. I would say that the slap is not a reinforcer because reinforcers are supposed to be pleasant. A pigeon pecks a key because it wants food, but the baby isn't crying because it wants to be slapped. We could probably prove this by just waiting, over and over, for the baby to stop crying completely before we slap it. If it started crying every time right after we slapped it, that would mean that the slap is a UCS. We wouldn't want to actually do this, of course, and we probably wouldn't need to, since we already know that babies cry after they're hit hard enough.

This answer is strong enough to earn about 7 points, but it is still disappointing in three respects. First, the student seems to think that for a stimulus to function as a reinforcer, the stimulus must be “pleasant”. In fact, it seems apparent that it was the aversiveness of the slap that led the student on the path toward defining it as a UCS. But the experiential value of a stimulus is

irrelevant to the definition of reinforcer; to sadists, stimuli that most people would consider highly aversive—and that in fact cause the sadist great pain—can serve as powerful reinforcers. Second, the student is focusing unnecessarily on the intentions of the baby, which are also irrelevant here. Third, the test suggested by the student is relatively weak. He or she might have strengthened it by suggesting, for example, that the intensity of the slap be varied. More intense UCSs tend to produce more intense UCRs (although not always). A suggestion of this sort would have been impressive. But the kind of procedure the student suggested is still weak in that it does not rule out the possibility that in the procedure described in the original question the slap was in fact functioning as a reinforcer. Perhaps once a baby is already crying, slapping the baby really does reinforce the crying. How do we rule this out?

**Example 5.** The behavior is respondent. No, the slap is not a reinforcer. It is a UCS. We can't know this from the procedure described in the question, but we can seek to prove it with a different procedure. All we have to do is slap the baby from time to time without regard to what it's doing. Ideally, we would do this at about the same rate that the caregiver was slapping the baby. If the slap were really a reinforcer, it would strengthen whatever behavior it happened to be following—babbling, rocking, clapping, or whatever—and therefore we probably wouldn't see any crying at all. But if we slapped the baby from time to time without concern for what it was doing, we would probably still get a great deal of crying. In fact, if we slapped a baby at the same rate the caregiver was slapping without any regard for what the baby was doing, it's likely that we would get the same amount of crying (or the same intensity of crying) that the caregiver produced. That could only mean that the slap was a UCS, not a reinforcer.

I would give this answer 10 points, although it could have been improved by drawing a distinction between the initial crying (which presumably is not caused by slapping) and the crying that occurs later (which is caused by or at least intensified by slapping).

If you have never run across a problem like this but were able to answer it easily, in my view that means you truly understand the basics of operant and classical conditioning. If, on the other hand, you had trouble answering this question, I would argue that in some sense your understanding of the difference between operant and classical conditioning is superficial—governed by definitions rather than by concepts.

Are there specific kinds of knowledge that would make it easier for a student to answer this question? Of course. Familiarity with procedures or concepts like respondent-independent reinforcement (sometimes erroneously called “non-contingent” reinforcement), variable-time (VT) schedules, or yoked schedules would help. But I would argue that just basic knowledge about operant and classical conditioning—and a true appreciation of the differences between them—should allow someone to answer the crying-baby problem correctly. In every course I have taught, some students have indeed answered the question perfectly, so it can be done.

But why are so few students able to do this (at least in my experience)? One very general answer is that in specialized courses, such as courses on learning, we do not explicitly teach analytical skills—even in courses called behavior “analysis”. Rather, we assume that college students already have such skills. But since high schools also do not teach such skills, it is not really clear where the vast majority of students are supposed to get them.

When it comes to courses on learning, I also think we inadvertently lead students away from the correct answer. Too

often—following the content of our text books—we teach almost exclusively using positive examples. We teach what a reinforcer is, but not what it is not. Even worse, we are content when, on exams, our students can do little more than parrot the basics—again focusing on positive examples. The rampant tendency for instructors to rely exclusively on multiple-choice tests to determine what their students have learned just makes things worse.

It is not my intention here to drift off into a discussion about didactic methods, and I am going to resist the temptation. Suffice it to say that it troubles me that I have run into so many people over the years—including a few colleagues—who are unable to give a reasonable answer to the crying-baby problem.

If you feel that this problem is not a valid test of elementary knowledge about operant and classical conditioning, I would be interested in hearing why. And if you feel that my own answer to the crying-baby problem is inadequate, feel free to share that with me as well. Over the years, I have heard more than one alternative answer that I thought had merit.

One reason why I feel strongly that the crying-baby problem is a reasonable tool for determining someone's real understanding of the basics of operant and classical conditioning is because this problem barely even touches upon truly complex issues. All interventions produce multiple effects on behavior, both short term and long term, and all behavior is the result of multiple causes; although the crying-baby problem can be looked at in the context of multiple causes and effects, one can also approach it and indeed solve it using only basic facts about operant and classical conditioning. Advanced concepts in behavior analysis tend to cause unnecessary confusion in introductory courses, in my experience. One idea I have learned never to introduce in elementary courses (and some instructors will disagree with me on this, of course) is that operant and classical conditioning are in fact inextricably related procedures. One cannot perform one procedure without inadvertently performing the other. We may choose to focus on only one set of relationships (say, between a response and its consequence) and one kind of outcome (say, a change in frequency of responding), but other relationships also necessarily exist: if that consequence is effective as a reinforcer or punisher, then it also necessarily functions as a UCS or CS; thus, classical conditioning must also be taking place. The same is true in a classical conditioning procedures: we may choose to focus on the pairing we have arranged between a CS and a UCS, and we may choose to observe only the new responding that is elicited by the CS as a result of these pairings, but our pairings have necessarily produced operant conditioning as well. After Pavlov rings the bell, the dog necessarily behaves in some way before being fed, and that behavior is undoubtedly reinforced.

Can the crying-baby problem be dissected at this more sophisticated level of analysis? Most definitely. I am still waiting to give someone extra credit for such an answer.

### 3. Problem two

#### 3.1. Comfort or ignore?

My first two children were born while I was in graduate school, and I am now the proud father of four children and two young stepchildren. Not long after my first child was born, I found myself occasionally needing to bring him to my office, which was down the hall from B.F. Skinner's office and Harvard's famous pigeon laboratory. I had set up a portable crib in my office for such occasions.

One afternoon I left my son sleeping in the crib while I attended to some matters in the lab. Surrounded by hundreds of

clacking relays and cooing pigeons, I had no way of knowing that my son had awakened and started to cry in my absence. When I emerged into the hallway, I was stunned to find that my son was now in the arms of a prominent developmental psychologist of anti-behaviorist leanings, who proceeded to berate me severely for having “ignored” my son’s crying. He interpreted my absence as a deliberate act—the mindless application of some sort of ill-conceived Skinnerian or Watsonian parenting technique. He insisted, following his own ill-conceived notions about parenting, that crying babies must be held and comforted. They are trying to “communicate the only way they know how”, he said. A crying baby should never be ignored, he told me. It was quite a lecture.

Skinner really did see the world in operant terms, but he also happened to have a very soft heart when it came to children. I do not recall him ever taking a hard line on the crying-baby problem. He did caution, of course, against inadvertently reinforcing inappropriate behavior. In contrast, John B. Watson, the founder of the behaviorist movement in psychology, was brutal in the advice he gave to parents about such matters. In *The Psychological Care of Infant and Child*, a highly influential parenting book he published in 1928, Watson gave precisely the advice that I had been accused of following: affection should be withheld from a child, and a baby’s crying should be ignored. Watson’s views both reflected and influenced public opinion in the United States in the first half of the twentieth century. In material prepared for parents by the U.S. Children’s Bureau, mothers were warned that picking up a crying child will teach that “crying will get him what he wants, sufficient to make a spoiled, fussy baby, and a household tyrant whose continual demands make a slave of the mother” (U.S. Children’s Bureau, 1924, p. 44).

The Watsonian view continued to prevail among behaviorally-oriented psychologists for quite some time and perhaps still does to this day. In a 1975 case study published by John Glavin and Linda Moyer, the crying of Moyer’s 8-month-old son was reduced in duration (at least while he was in a certain playpen) over a 14-day period through a procedure said to involve extinction: when first placed in his playpen (which would always occasion crying), the child had to remain silent for increasing periods of time before his mother picked him up again. On the first day, he cried for 25 min straight before finally calming down long enough to satisfy the initial, rather demanding requirement: silence for a full minute. (Note that the child had undoubtedly stopped crying for shorter periods during the 25 min of supposedly continuous crying.) The time required for silence was gradually increased to 45 min over a 2-week period, and over this period “initial crying upon being placed in the playpen decreased from 25 min to 1 min or less” (Glavin & Moyer, 1975, p. 357). The report said nothing about what happened to the child’s crying at other times or in other places, or, for that matter, how his mother and other adults reacted to his crying at other times or in other places.

Crying was treated as operant in the Glavin and Moyer (1975) report, but it is not clear that it was. The fact that the crying consistently occurred (even at the end of the study) when the child was put into the playpen suggests that it was respondent, occurring as a reaction to separation from his mother. And it is likely that the real operants here were simply a variety of unnamed behaviors that were incompatible with crying (a possibility acknowledged by the authors), accidentally strengthened when, following a set time interval, Mom finally picked the child up again.

The Glavin and Moyer (1975) study is one of several behaviorally-oriented reports suggesting that the duration or frequency of crying can be manipulated by withholding parental attention (see Chadez & Nurius, 1987; Etzel & Gewirtz, 1967; Hart, Allen,

Buel, Harris, & Wolf, 1964; Rolider & Van Houten, 1984; Williams, 1959; Wolf, Risley, & Mees, 1964). But even if crying can be manipulated through behavioral procedures, it clearly serves some fundamental need of the child (cf. Solter, 1997). Indeed, a correlational study published in 1972 by a psychiatrist/psychologist team from Johns Hopkins University suggested that, in general, children of unresponsive mothers (that is, mothers who ignored the crying of their children) generally cried more than children of responsive mothers (that is, mothers who responded quickly to the crying of their children) (Bell & Ainsworth, 1972). By looking at the lag between periods of time when crying was ignored and periods of time when crying occurred, the authors of this study hesitantly concluded that ignoring crying probably causes more crying over time. Although it is bad form to make causal inferences from correlational studies, Bell and Ainsworth’s assertion that crying is adaptive and “survival-promoting” can hardly be dismissed.

The main debate about crying has long been about whether to comfort or ignore, but one occasionally finds experts making other suggestions, some of them quite ludicrous. In an article in the *Journal of Clinical Child Psychology*, Thomas Dorsel’s number one suggestion for eliminating child crying is: “Do not allow acquisition” (Dorsel, 1978, p. 158). In other words, he says, never reinforce crying, which he quickly notes is utterly impossible. His next suggestion is: “Insulate against crying”. Yes, that means to block your ears or isolate your child so that you cannot hear him or her. “If the parents cannot hear the children crying, they are not likely to reinforce through attention or otherwise” (p. 158). (Needless to say, if the child is crying because he or she has just suffered a serious injury, the insulation technique will not only extinguish the crying, it might also extinguish the child.) Another suggestion: “Use a punisher that produces non-crying”—which, he acknowledges, might be “hard to find” (p. 158). He suggests reinforcing non-crying only “combined with” punishment. Most important, Dorsel notes that one should not attempt this program “half-heartedly”—that one should not even think about trying to tackle a crying problem unless one is stalwart and determined (p. 158). The absurdity of such suggestions brings us, once again, to our original dilemma: whether to comfort or to ignore.

The solution, once one sees it, is simple. Yes, of course, crying is in some sense a baby’s way of communicating. It is almost always a sign of distress: pain from teething, discomfort caused by a soiled diaper, alarm or a bruise resulting from a fall, and so on. In this sense, Dr. Developmental Psychologist was right: completely ignoring a cry makes little sense. At the very least, one needs to try to locate and remove the source of distress. Moreover, given that love and emotional bonding are important parts of the parent–child relationship, it could reasonably be argued that a baby in distress should always be held and comforted. Even putting aside the bonding issue, as a practical matter changing a diaper or holding and rocking a child is sometimes the only way to keep it from crying for a very, very long time.

On the other hand, doesn’t one also need to be concerned about inadvertently reinforcing the crying? We concluded in our first problem that the crying we were observing probably was not operant, but couldn’t we conceivably create an operant form of crying? That is clearly the logic behind the school of thought that recommends ignoring, and, as I noted above, ignoring does seem to reduce the frequency of duration of crying in certain contexts. Even if we are not concerned about operant crying per se, we are definitely teaching something when we pick up and comfort a crying baby. Shouldn’t we be careful about what we are teaching?

I am deliberately setting up the issue to try to create some confusion. But the confusion disappears when one focuses on key issues and sets aside unwarranted assumptions. We know,



unequivocally, that a crying baby will learn when we interact with it. That point is indisputable, and as teachers we certainly want to be concerned about what we are teaching. We can also be reasonably confident that crying is virtually always a sign of distress. As caregivers, we need to be concerned about relieving that distress. Is there a way to satisfy both legitimate concerns?

As for unwarranted assumptions, it goes beyond the facts to assert that comforting a crying baby necessarily teaches the baby to cry. If a particular episode of crying is the result of elicitation by an aversive CS or UCS (very likely), and as long as crying cannot always be strengthened as an operant (also likely), then comforting a crying baby does not necessarily teach inappropriate behavior. By introducing pleasant new eliciting stimuli, we may just be mitigating the effects of the aversive ones. In effect, we are reducing the baby's distress by creating a compound stimulus that is less aversive than the one that produced the crying. Once we finally remove the offending stimulus—in other words, once we finally change that diaper—the pleasant elicitors can then do their work unobstructed. Our intervention may not be teaching inappropriate behavior at all; rather, it might simply be teaching the child that Mom or Dad is quite a wonderful CS.

It also goes beyond the facts to assert that ignoring a crying baby necessarily teaches the child something positive. Yes, of course, the crying will eventually stop (more about that shortly), and, yes, of course, a crying baby left to its own devices might adapt to the aversive stimulus and might also eventually learn to comfort itself. Babies allowed to cry themselves to sleep (while Mom and Dad are nervously watching the baby on video monitors in another room) have been observed to rock themselves in much the same way that Mom or Dad rocks them. But the learning that takes place here is left entirely to chance. Even if appropriate self-comforting behavior emerges over time (through what I have long called “generative” processes; see Epstein (1996, 1999)), it might not be particularly efficient self-comforting behavior, and it is certainly not behavior determined explicitly by the well-meaning caregivers. We might also worry here that ignoring a crying baby teaches something negative: that Mom and Dad are extremely weak CSs, for example—in other words, that they are fairly useless when the going gets tough.

The assumption that comforting a crying baby is absolutely essential for normal development is also disputable, no matter what animal analogs one might point to and no matter what retrospective, correlational studies one might bring to bear on the matter.

On the learning side of things, there is one aspect of the (second) crying-baby problem that is clearly problematic: when we ignore the crying, at some point it will almost certainly become louder (or in other respects more intense and hence more difficult to ignore). This makes good sense from an evolutionary perspective. Given that crying is, to begin with, a way of calling for help, when that call is failing to produce results (that is, relief from distress), an increase in intensity would seem to be nature's very reasonable way of getting the caregivers moving. It is undoubtedly no coincidence that as a baby's cry gets louder, it also often becomes more shrill and irritating. In rare cases, parents remove the offensive sound through extreme acts of violence; for obvious evolutionary reasons, it is much more common for caregivers simply to become more responsive to the baby's needs. In any case, one common and unfortunate pattern in parenting is for the baby to cry and the parent to ignore, and then for the baby to cry increasingly louder until the parent finally responds. To the extent that crying has an operant form, this is a scenario that is likely to produce that form. The baby is learning that under various conditions of distress, loud crying is more effective than soft crying (that is, loud crying is more likely to be negatively reinforced).

I could go on, but let's stop here: babies learn, and they also have legitimate needs. We want to meet those needs, and we do not want to teach inappropriate behavior. So should we comfort or ignore?

Neither one. The solution to the (second) crying-baby problem is simply to wait attentively for a pause. Again, my apologies. If, as an expert on behavior, this has long been obvious to you, I have been wasting your time and perhaps demonstrating my own ignorance. But if this solution is well known, it has certainly not been well publicized, and even with Skinner as my daily coach for a number of years, it did not occur to me until, as I said, my third child came along.

When a baby starts to cry, it is important that we immediately attend—that is, pay attention—but not necessarily that we show attention. We attend in order to determine the urgency of the situation. If the baby has been bitten by the cat or stabbed by a safety pin, we may need to take action immediately. In a genuine emergency, concerns about health and safety need to take precedence over concerns about learning.

In the vast majority of cases, however, the best way to handle a cry is by waiting for it to subside—and then intervening immediately. The goal here is make our interventions serve two legitimate purposes simultaneously: whatever the form of the initial intervention—picking the child up, offering soothing words (“What happened, my love? How can I help you?”), hugging, caressing, and so on—ideally, it should follow a pause in the crying, or at least a decrease in intensity.

This is remarkably easy to do. To do it properly, however, you need to attend very carefully to the child's crying. If you have ever experienced the very tangible power of using a “clicker” to shape the behavior of a rat, pigeon, or dog, you know just how important your timing can be in this kind of situation. Please note that attending to a baby's crying and waiting for a pause is the very opposite of ignoring the crying. Ignoring crying is probably poor parenting, just as Dr. Developmental Psychologist said it was.

Speaking of shaping, once you have started using the wait-for-a-pause procedure, it is a simple matter to shape longer and longer pauses, which can, to some extent, be tied to observable behaviors. I do not think anyone knows at this point what the specific behaviors are that allow a baby to “calm down,” but they are almost certainly operant: inhaling or exhaling forcefully, closing his or her eyes, tightening facial or other muscles, turning away, and so on. When you make your interventions contingent upon signs of calming down—at first, virtually any signs and, over time, clearer and more significant signs—you convey a clear and very loving “message” to your baby: I love you; I am always ready to help you; and I love it when you calm down, however you manage to do so. When a baby starts to become verbal, this message can be conveyed not only through the timing of the intervention, but also in words. Note that this technique, unlike those reported by Galvin and Moyer (1975), Chadez and Nurius (1987) and others, is response-based, not time-based; the immediacy of reinforcement, tied to specific signs of calming down, is critical.

If you are waiting for my data, again, with apologies, I must disappoint you. I do not have any—other than the anecdotal sort—and I do not intend to collect any formal data. This procedure works for the same reasons that all operant conditioning procedures work, and it is far superior to the two simplistic alternatives. Watson was wrong: babies really do have legitimate needs for love and attention. But Dr. Developmental Psychologist went too far. Perhaps in part in his zealous rejection of Watson's extremism, he insisted on lavishing love and attention on the infant no matter what the infant was doing. This is not necessarily harmful to an infant, but it does miss out on hundreds, if not

thousands, of potential opportunities for teaching. When he rescued (at least in his own mind) my son from my office that day, did he listen for that pause before reaching down into the crib? I doubt it. Would he have harmed my son by waiting a few additional seconds for a pause to occur? It is hard to see how. Might my son have begun to learn something important if the loving rescue immediately followed a pause in his crying? Most definitely.

You know the waiting-for-a-pause technique is working when the bouts of crying become shorter and less intense; this happened rapidly with my younger children. It is almost as if they were saying, “Okay, I have given you the evolution-driven crying signal. Now I have calmed down to some extent, and I am waiting for you to rush in and help”. My two middle children, now ages 12 and 13, are the calmest, happiest children I have ever seen. When upset for any reason, they also take pride in being able to calm themselves down almost immediately. They figured out how to do that almost at birth, after all. Friends who have asked me for parenting advice have applied the technique with equal success. Why not? There is nothing even slightly magical about it. It just involves some careful attending and good timing.

### 3.2. Overlapping problems

Isn't waiting-for-a-pause the same as any other differential reinforcement procedure? Isn't it just a DRO, DRA, DRI, or DRL procedure applied to the crying baby? This brings me, as promised, back to the first crying-baby problem.

In differential reinforcement procedures, we strategically withhold reinforcement until any other (DRO), a specific alternative (DRA), or a specific incompatible (DRI) behavior occurs, or until the target behavior occurs at a low rate (DRL). The goal is to reduce the frequency of our baseline operant.

But when a baby is crying, it is not clear that we have an operant to begin with. It is more likely that the crying is elicited by an aversive CS or UCS. When a pause in crying occurs, behavior that is potentially operant in nature—a shift in attention away from the CS, perhaps, or a forceful inhalation—can potentially be reinforced. The reinforcer now has a dual effect: it strengthens the mysterious “pause” behavior, and, overlaid onto the aversive CS or UCS, it mitigates the eliciting power of that stimulus. When the reinforcer is part of an intervention that removes the noxious stimulus that produced the crying in the first place, it presumably becomes especially powerful, and it undoubtedly creates or strengthens a number of new conditional stimuli—among them, stimuli generated by the loving caregiver.

In differential reinforcement procedures, the principal function of the reinforcer is to alter the relative frequencies of two or more operants. In the waiting-for-a-pause procedure (applied to crying), the principal function of the reinforcer is to strengthen operant behavior that reduces the intensity of respondent behavior. On the surface, these two procedures look the same—just as

the slapping procedure looks exactly like an operant conditioning procedure—but functionally they are very different.

Why the waiting-for-a-pause procedure is not widely used completely baffles me. Even without behavioral scientists around, effective behavior management techniques tend to evolve on their own; sometimes they are even superior to the modest interventions experts are able to describe. So why do parents still either ignore or comfort their crying babies, and why are parenting experts still debating this issue?

Perhaps the problem is the lack of a catchy name for this simple procedure. “Waiting for a pause” clearly won't do. Suggestions are welcome.

### Acknowledgment

I am grateful to A. Charles Catania, Paul Chance, Edmund Fantino, Yoshito Kawahara, and Stephanie Stolarz-Fantino for comments on a draft of this paper. Paul Chance's excellent suggestion for a name for the waiting-for-a-pause procedure described in the second half of this paper is “Quiet Training”.

### References

- Bell, S. M., & Ainsworth, M. D. S. (1972). Infant crying and maternal responsiveness. *Child Development*, 43, 1171–1192.
- Catania, A. C. (1979). *Learning*. Englewood Cliffs, NJ: Prentice-Hall.
- Chadez, L. H., & Nurius, P. S. (1987). Stopping bedtime crying: Treating the child and the parents. *Journal of Clinical Child Psychology*, 16(3), 212–217.
- Dorsel, T. N. (1978). Crying: Easily established, but difficult to eliminate. *Journal of Clinical Child Psychology*, 7(2), 156–158.
- Epstein, R. (1996). *Cognition, creativity, and behavior: Selected essays*. Westport, CT: Praeger.
- Epstein, R. (1999). Generativity Theory. In: M. A. Runco, & S. Pritzker (Eds.), *Encyclopedia of creativity* (pp. 759–766). New York: Academic Press.
- Etzel, B. C., & Gewirtz, J. L. (1967). Experimental modification of caretaker-maintained high-rate operant crying in a 6- and a 20-week old infant (*Infans Tyrannotearus*): Extinction of crying with reinforcement of eye contact and smiling. *Journal of Experimental Child Psychology*, 5, 303–317.
- Glavin, J. P., & Moyer, L. S. (1975). Facilitating extinction of infant crying by changing reinforcement schedules. *Journal of Behavior Therapy and Experimental Psychiatry*, 6, 357–358.
- Hart, B. M., Allen, E. K., Buel, J. S., Harris, F. R., & Wolf, M. M. (1964). Effects of social reinforcement on operant crying. *Journal of Experimental Child Psychology*, 1, 145–153.
- Rolider, A., & Van Houten, R. (1984). Training parents to use extinction to eliminate nighttime crying by gradually increasing the criteria for ignoring crying. *Education and Treatment of Children*, 7(2), 119–124.
- Solter, A. J. (1997). *Tears and tantrums: What to do when babies and children cry*. Goleta, CA: Shining Star Press.
- U.S. Children's Bureau (1924). *Infant care*. Care of children series no. 2. Bureau Publication No. 8 [Revised].
- Watson, J. B. (1928). *The psychological care of infant and child*. New York: Norton.
- Williams, C. D. (1959). The elimination of tantrum behavior by extinction procedures. *Journal of Abnormal and Social Psychology*, 59, 269.
- Wolf, M. M., Risley, T. R., & Mees, H. I. (1964). Application of operant conditioning procedures to the behavior problems of an autistic child. *Behavior Research and Therapy*, 1, 305–312.