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Basic and Applied Monitoring Standards

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Preliminary Comments

You have a blue handout, and the reason your handout is blue is that my wife Nancy Hughes, who is in the front row -- Nancy wave your hand please -- said, you know I think blue paper is prettier than white paper. Besides you can see if people take yours home or not. You can look around and tell them apart from the white ones. If there's any blue ones left you didn't do so well. If all the ones left are blue you did quite poorly. And if there's a lot of white and yellow paper around, but no blue, well maybe people are going to take it home and read it.

What you have here is a rough little outline, which I probably will try to stay moderately to, but it's almost the functional equivalent of my reading notes would be. And the overview is essentially that I'll try to address myself to the questions that the panel sent me, where we are, what we are going to do, and so forth, with a little brief reference of what we set out to do.

What We Set Out to Do

Now, I was Skinner's first student to work systematically with human organisms, with people. And we set out to kind of convert our laboratory research to the human case. And the original idea was that a catatonic patient is probably a person who has been on total extinction. And all we have to do is get ahold of some catatonic patients at Met State Hospital. Put them in 6 by 6 foot room. Locate a reinforcer. Reinforce them first on a Continuous or Fixed-Ratio 1. Put them on a Fixed- Ratio, then a Variable-Ratio, and we will bring them back to health through powerful contingencies. So that was the plan.

We wanted to change as little as we could, when we went from the animal - pigeons, rats, octopi, horses, and so forth -- to the human case. And we were so pure about that that I actually advertised in the local newspapers for deaf-mutes to be the aides that took the patients from the wards and back and forth to the laboratory, so they wouldn't be tempted to let poor instructions occur. At that time we were very proud of it. We were very suspicious of behavior that was generated by instructions. And we all believed that behavior was built by consequences was more powerful and was more real. The Azrin and Skinner study on cooperation had absolutely no instructions. The kids figured out how to cooperate. And we felt that was better and more real cooperation than would come from any instructions. I only merely point this out the degree to which we went to keep things the same.

Where We Stand

Now where are we? Well basic and applied analysis have clearly drifted apart. I just skirted over this one {slide}, which you have. And that's where we stand: Basic and applied analysis

have drifted apart. I think the split is between the labs and the clinics. Essentially the previous thinkers have touched upon this from a different angle. The animal labs and the few human labs -- and I love the human labs and I wish I could support them, but I am so busy trying to keep decent measurement going on in the far applied area, in the public schools and so forth, that I just can't give proper attention to the human operant. I wish I could split into two people and one of me could attend each and every human operant session at this meeting. I just can't do it. And I apologize for not being able to do it.

Now, why is the split? Well, the analysis terms are similar. In general I agree with Dr. Jim Johnston that they are much fuzzier and much harder to work with in the clinics, behavior analysis done in the clinics, than they are in the laboratories. Even the laboratory ones are not clear.

Okay, now why do you need a lab? And you need a lab to _rule out_ other variables. The function of the walls on the pigeon box was to keep other pigeons out, not to keep that pigeon in; to keep truck noises out, not that pigeon in. And I often said to Skinner when I was his assistant at Harvard, our demonstrations were powerful because there were no walls on the demonstration apparatus. There was merely a reinforcer magazine. You walk into a room with pigeons on your shoulders, and they would _fly_ to work. But the trouble is, two would go at once, and have a fight over the operandum if they were on the same schedule, and so forth. So the lab is used so that when you manipulate a variable you know one and only one variable is there.

Now, in the applied work when a person does a token economy, do we know the token did it? How many think we know the token did it? Put your hands up. How many think the token didn't do it? Put your hands up. Okay, put a foot up. I guess we have got a bunch of people that can't raise their hands. Totally passive audience. You've been trained to be this way. I am not going to go on until the people who think the token did it put a hand up.

< I think we did it. We don't know that it did it.>

All right, did the article say the token did it? Put your hands up if you think so at all. Do you really know the token did it? How many think you don't really know? Put your hands up. Great!

Now, let me give you an example of this. I was doing a workshop in Great Falls, Montana. And they were showing me the really neat, new token economy in the classrooms of Special Ed kids. And this is vintage of 1967-68, right. Ray Beck was the director of the project. It was an old Knights of Columbus Hall that they had taken over; they had made into an MR center and so forth. He said, we can't show you the classrooms because we ran out of M&Ms and candy. I said, "Okay." I said, "Well, let's go in. I'll show you a trick." So, I went into the classroom, and I said, "Okay! What I've got here is a bag of M&Ms." And I shook an imaginary bag. And I went over to a kid, and I said, "Okay, everybody do their math problems, so the first one through gets an M&M, etc.,..." A kid raises his hand. I took him over. I put my hand in the bag. I took out an imaginary M&M. Put it to his hand. He said, "I don't want it." <audience laughter> Right? He did his work! For an imaginary bag. He said, "I don't want it." And I said, "What's the matter?" He said, "I want a green one." <audience laughter> This really happened! And it had a big effect on that MR center. It had a big effect on Ray Beck. He's been locked into Precision Teaching ever since.

What does it tell you? That when you present a token you usually, before you do anything, you make eye contact. If it is hostile eye contact what happens? You wait until the kids eyes warm a little. You know what I am talking about. You wait for like warm eyes. Then you kind of reach out and take his hand. If he pulls his hand away, you've got to warm the eyes a little more, right? And then you cup his hand and you gently place it in, and as the M&M touches his skin, you kind

of close your hand a little about it, signifying kind of mechanically that "This is your M&M now." And you smile a little more, and "I'm very, very glad you did your math." So what that token really is in that situation is a catalyst for a sharp, regular conditioned reinforcer. And you had to put the M&Ms in there not for the kids to eat, but for the teachers to remember to smile, and wait for a warm eye. I don't know what I am talking about here, but that shows you that the article is wrong, all that token stuff. When tokens don't work, there's not anything wrong with the chocolate. What's wrong was the delivery of the chocolate, which was not recorded, and so forth. So, that's what's wrong with applied research. We don't really know the thing is even labeled correctly. We don't know if it is in the right category. So when it doesn't work, and doesn't work, we don't really know what happened. So there is problems in the analysis, in the terms, and in the descriptions.

The experimental designs are fairly similar, and I think in not too bad of shape.

The recording is atrocious. There is almost nothing you can do with applied research recording as it now goes on. The laboratory stuff is still fairly clean and fairly clear.

So, as an example of the atrocious recording, I'll show you a bunch of slides. This is the kind of stuff in the current book by Repp and Singh {1990}, on, I forget what the title is, it's the hottest, most complete, 33 articles, on nonaversives. There's only a few articles in it that have data. One-sixth of the articles have data, one-sixth of the 33 chapters have data in them, and only a few have the data, and this is the form that the data is presented. And you can't do anything. <overlays the different charts and figures on top of each other on the overhead> The human eye can't handle that. <audience laughter>

Where We Can Go

Standard celeration charting is a way out of it. How many of you know about standard celeration charting, hands up? How many don't? Well, there's a few.

So anyway, the power of the free operant of the 50s was standard recording. I believe that standard charting will help clarify communication between labs and clinics. Our idea about the labs and clinics, my idea was that when a problem came up in the applied setting that we couldn't solve -- we didn't know why the tokens weren't working; is it the tokens don't have warm eyes around them anymore, or what -- we have to go into labs to do that. So, we present warm eyes without chocolate. We present M&Ms without warm eyes. And we present M&Ms together to see if it is the combination that's necessary. You only can do that really under laboratory conditions. Ideally you do it with the same children, with similar children. A lot of us built mobile labs those days on wheels.

Several different reasons why I went from a Metropolitan State Hospital lab with chronic schizophrenics, normal adults, normal children, autistic children, and so forth, to Education was one day my nurse, Alma, came to me, Alma Cole, and said, "You know, I think you should be worried about something. These normal children that you are running as normal controls against the children from the behavioral childrens unit, I don't think are really normal." I said, "Well, what do you mean?" She said, "Well, the cab driver tells me..." -- see, to get them from the public schools, we took them from the public schools, and to make sure we didn't have an automobile accident, and kill a kid and then lose the lab or something, I decided the safest thing to transport kids in is Yellow Cab. I mean, if an accident happens there it's not our problem. So, the cab driver said, "When we start coming up the grounds at Met State, the kids stiffen and turn white. And say things to me like, 'This is where all the crazy people are, isn't it?' 'Is that a crazy person over there?'" And he said they looked nervous, and stuff. So I built a little portable lab and put it out in the schoolyard, and measured behavior very carefully. Behavior was different in the schoolyard than it was in the lab under the same experimental conditions. So, okay, the next

thing is maybe this behavior is different in the lab than it is at the desk. It's quite obvious that if you want to know how kids do arithmetic and how reinforcers work and stuff you probably should do it on the arithmetic, and not have these approximations. So, we went into Education to do that.

Now, the other reason was that some people were already into Education, and they were not using rate of response nor were they using standard recording in the classroom. They would record rate in a lab on wheels outside the school, and percent correct in the classroom. So, I went into Education to try to put rate of response in the classroom.

Standard Celeration Charts

The next thing is standard celeration charts. I won't talk too much about those. You have a description of what they are. It's a standard set of charts. And like the cumulative response record, what is standard is the slope. A lot of people donUt realize that. On a cumulative response record, what was standard for the rat record was what the line of 4 per minute was; 4 per minute, 8 per minute, 2 per minute, 1 per minute. It wasn't until 1972, and I had been working with cumulative response recorders since 1953, that I realized that those grids -- those standard slopes on those recorders -- were separated by X2. And like about like a 20-30 or 18 degree angle was always X2 on it. So, it forced you to look at doublings in behavior, which made you look for big things. You don't get caught following an ant when you're supposed to bring home dinner! You are looking for decent sized things.

Standard Celeration Chart Terms

The terms -- the standard celeration chart terms are 'frequency.' And we switched from using 'rate of response' to frequency because it was more acceptable, more general. It made more sense to people in different fields other than our fields. So, on a standard celeration chart -- here's a standard celeration chart -- frequency is a dot. Learning or acceleration is a line, a line through a bunch of frequencies. 'Bounce' is how much it bounces. 'Up bounce' is how much it bounces up. 'Down bounce' is how much it bounces down. 'Spread' is if you put a bunch of dots on for all to present a whole class. Is the class with the lowest kid doing 10/min., the top kid doing 30/min., what is the spread? Times 3. That's the range, but in the multiply world you divide by it rather than add it.

Relationships from SCC Collections

The effects, however, we had a big trouble with the effects. And the book that is published by Pennypacker, Koenig, and Lindsley (1972) has very awkward terms. We finally came up with the terms to describe these effects. When you change a behavior it either jumps up, jumps down, or no jump. After the jump, which is usually in the first or second day if it is a daily chart, the behavior either accelerates, maintains, or decelerates. But, it either jumps up, jumps down, or no jump. And then it either turns up, no turn, or turns down. Those words can be used at the first grade level, kindergarten level, parent level. And I think we think clearer with those terms from childhood than we do talking about counter- celerations, and all those kinds of things. So, you've got jumps and turns. The road jumps to the left. The road jumps to the right. The road turns left. The road turns right. The road jogs left, turns left. The road jogs left, turns right. Jumps up, jumps down, no turn.

The literature has all possible combinations of these, which means that reinforcement is not a unitary procedure. Neither is punishment. And basic research should take this basic information we've got in applied research and start studying it in the laboratory. Under what conditions does a reinforcer produce a jump up and a turn down? Under what conditions does reinforcement produce a jump up and no turn? A jump up and a turn up? That whole area is really almost

impossible to work with in the applied setting without controls and so forth. If I went back to the labs I would start on that right now, because it is front end stuff. It means no longer can we say reinforcer or punisher. We have got to have two words for the two different effects of reinforcer. Now, you can partly handle this jump up, turn up thing, you can say that the turn, like a jump up as a reinforcer, with a turn down, is maybe a reinforcer with built-in satiation. But catch-22, the jumps and the turns are not related. They're independent. I found that out already by analyzing about 1000 studies. So, we know that nature is a little more complicated out there than we have ever yet thought. And we need the labs. We need the human labs. I would recommend human labs, but if they won't then animal labs. If nobody else will do it then an octopus lab do it.

Important New Area for Basic Analysis

So, we need to analyze the relationship between jumps and turns. We know they are real, because 30% of the published literature, already published before the concept, had either jump up and turn down -- opposite you see -- or jump down and turn up. They are very dangerous because the reinforcer one tells you you are going to lose your effect if you don't stop the experiment, because the behavior jumps up and it is turning down. The punishment one tells you, stop the punishment, you're underpunishing, and you are case hardening the kid. So, the hottest area of research right now, I think, that has to be done in the laboratories is under what conditions does under- punishment occur, and can you get out? Is underpunishment client determined: If you increase the intensity of the punisher, that you still get a jump down and a turn up. And this means it is a very tough person. If you increase the intensity and you get a jump down and no turn up, this means you did not have a strong enough punisher. You underpunished. You chickened out. It's very closely related to surgery. The Italians have a word for training surgeons, and they say "a chicken surgeon." That's a guy who makes a little hole -- oop -- not big enough, make the hole bigger -- whoop -- not big enough, make the hole bigger. A chicken surgeon leaves a wormy wound. A chicken punisher underpunishes and probably case hardens the client.

Now, why is this so important? There is one variable even more important that we cannot study in the applied setting, we could study in the lab, if you have enough guts to do punishment in the lab anyway is, when you get a jump down and a turn up with a maximum stimulus -- SIBUS turned to the top -- is it possible just with adaptation -- I was an electrophysiologist -- just with adaptation on a peripheral nerve, could you like punish every other day? Put him in a camisole in between. Punish every third day. Is there an intermittancy of that punishment that you could do, and which with the same intensity stimulus you would not get the turn up showing you adaptation

Conclusions

My conclusions are: Technology is now available to re-chart and standardize published results, so we can see what happened and compare studies. Unbiased quantitative literature reviews are possible. The independence of jumps and turns is a rich research field. And I urge the most important clinical study is what about the jump downs turn ups in punishment, and can we find out some way to intermittently do punishment, so without having to increase the stimulus, we can prevent the adaptation from happening. Thank you.

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