

Chapter 2

“The Lovaas Model: Love It or Hate It, But First Understand It”

Ronald Leaf and John McEachin

I have obsessed over this presentation. My wife and my boys would say I have been possessed. It has given me a chance to reflect, regret, and rejoice my 11-year journey working with Ivar. If it was not for Ivar, I would not be here today. I would not be in the field either. Most likely, I would be chasing ambulances or perhaps become a politician.

I am grateful for the opportunity to be able to clarify and describe my 11-year journey working with Ivar. Because whether you love, hate, or are indifferent to the Lovaas model, it is likely that you may not know exactly what occurred during the Lovaas project.

Unfortunately, there is a tremendous amount of misinformation and misinterpretation of what occurred at UCLA (Leaf & McEachin, 2008). It is one of the reasons why we wrote, *It Has To Be Said* (Leaf, McEachin, & Taubman, 2008). This was the cover that we, well at least I, wanted to use—Lemmings jumping into the sea—but our publisher thought it was slightly offensive (Fig. 2.1).

So we compromised on this cover (Fig. 2.2).

One of the chapters we wrote was devoted to clarifying the Lovaas model (Leaf & McEachin, 2008). The senior members of Autism Partnership felt we needed to fully clarify and describe what occurred during our generation. This is us more recently (Fig. 2.3):

And this was us long ago (Fig. 2.4):

We have been together for a long time, longer than our marriages.

R. Leaf, Ph.D. (✉)

Autism Partnership, 200 Marina Dr., Seal Beach, CA, USA

e-mail: Rlautopar@aol.com

J. McEachin

Autism Partnership, 200 Marina Drive, Seal Beach, CA 90740, USA

e-mail: JMAutPar@aol.com

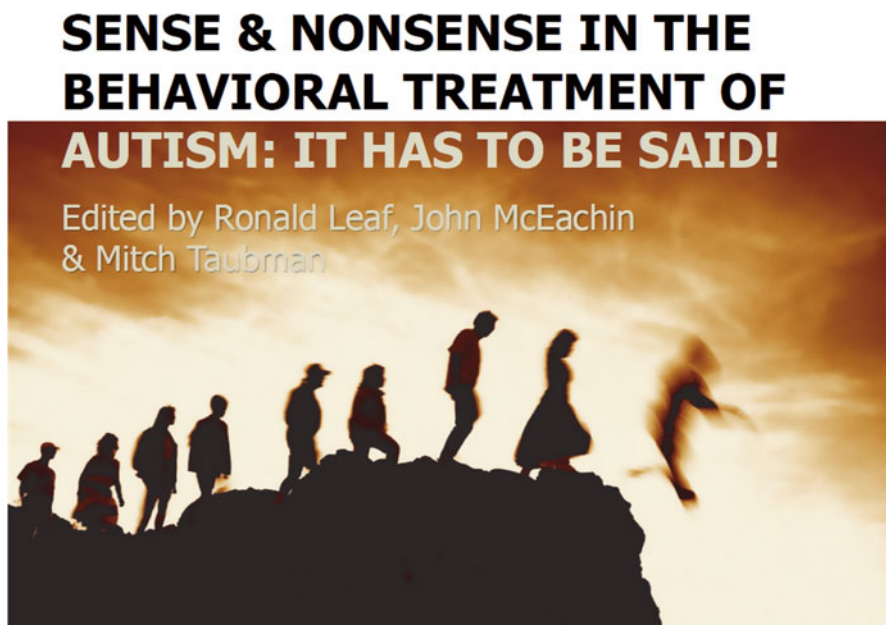


Fig. 2.1 Early draft of book cover, “Sense & Nonsense in the Behavioral Treatment of Autism: It Has to be Said”

Personal History

My journey in Autism started in 1973. I was an undergraduate student, a political science major in my junior year at UCLA. I needed a class on Tuesdays and Thursdays from 2:00 to 3:15. You may ask why that specific day and time? Well because it would allow me to only have to go to school 2 days a week. When I got the schedule of classes I narrowed my choices down to two classes, an art history and a psychology class. I asked my friends the very important question, “What’s the easiest class?” They said they were both easy “A’s.” So now what was I to do? I looked at the location of the classes. UCLA is a big campus so I did not want to walk too far. They were both equally close to my other classes. So before I flipped a coin, I asked my sister-in-law, who was a double major in art history and psychology, for her advice. She asked what the classes were. I said one is Integrated Arts. She approved, saying it was a brilliant class, her favorite class ever at UCLA, and that Professor Kaiser was amazing. She wanted to know what the other class was (Fig. 2.5).

I answered it was Foundations of Behavior Modification; Ivar Lovaas is the professor. She said, “He does evil work. Don’t take the class.” I was intrigued; I took the class. After the first week, I decided to change my career path. I was captivated by autism and intrigued and inspired by Ivar. That is how I got into the field.

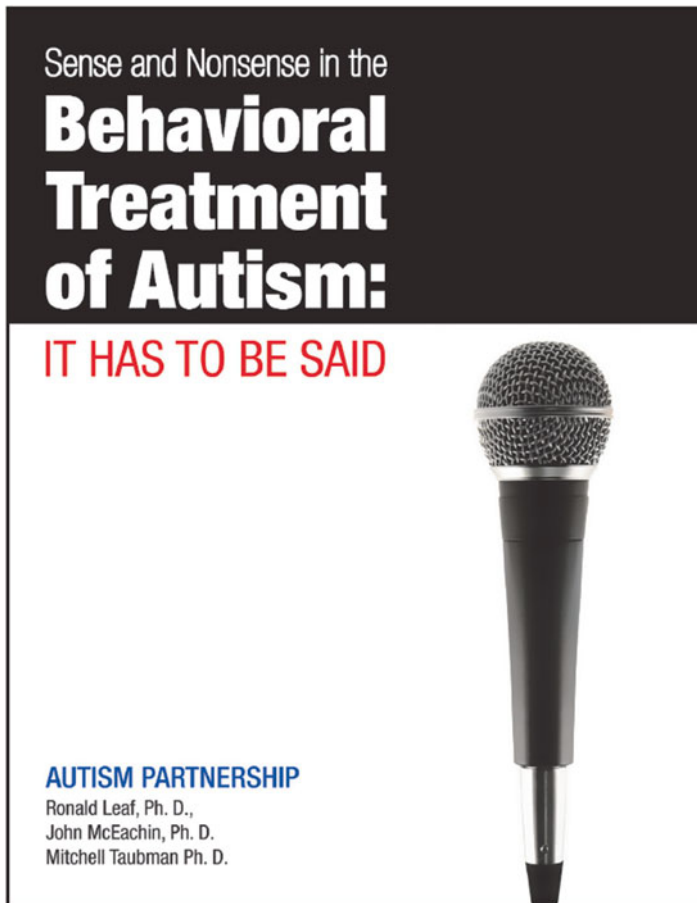


Fig. 2.2 Final version of book cover

An Overview of the Lovaas Model

Nowadays, we hear about the Lovaas model, but I never quite know what that means. Is it the model of the early 1960s, the pioneering days of autism when little was known about autism? (Fig. 2.6)

When children were referred to as being afflicted with childhood psychosis or childhood schizophrenia? When children lived their lives in state institutions? When self-injurious behavior was referred to as self-destructive behavior? Are those the days they were talking about? When Ivar and his army of undergraduate and graduate students did everything they could do to conquer the devastating disorder of autism?



Fig. 2.3 Recent Photo of Autism Partnership Senior Staff (clockwise from upper left): Mitch Taubman, Ron Leaf, John McEachin, Andi Waks, Sandi Slater, Tracee Parker & Marc Mullins



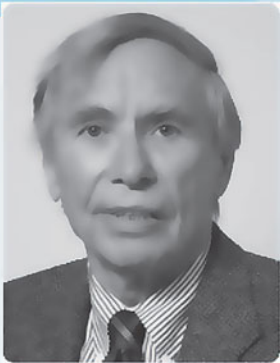
Fig. 2.4 Photo from 1970's


Tuesday & Thursday

2:00 - 3:15

Foundations of Behavior Modification

170 A









Fig. 2.5 UCLA Course listing for Psychology 170A

THE LOVAAS MODEL???



1960's

John Berberich

Bradley Bucher

Gill Freitag


Irene Kassorla

Benson Schaeffer

Bob Koegel

Judy Long

Laura Schriebman






Fig. 2.6 Lovaas Associates during 1960's



Fig. 2.7 From Life Magazine 1965

VIDEO CLIP #1: <http://www.autismpartnership.com/post/video-links-lovaas-model>

Life magazine in 1965 did a feature article on the Lovaas model (Moser & Grant, 1965). They noted the use of punishment and the controversy around using punishment (Fig. 2.7), but they also noted the use of reinforcement, how caring the staff were and just how innovative the treatment was.

This clip demonstrates just how innovative the treatment was 50 years ago.

VIDEO CLIP #2: <http://www.autismpartnership.com/post/video-links-lovaas-model>

Or, when referring to the “Lovaas Model,” are we talking about the model from the late 1960s (Lovaas & Simmons, 1969) or early 1970s (Lovaas, Koegel, Simmons, & Long, 1973)? (Fig. 2.8)

Or the mid-1970s or 1980s (Lovaas, 1987)? (Fig. 2.9)

In reality, there is no *single* Lovaas model because the work done at UCLA was dynamic, creative, and ever-changing. We were constantly evolving. When I started in 1973, it was completely different than when I left in 1984. We were not using physical punishment anymore. We embraced reinforcement in a very different way. So, even within my generation, it was always evolving and changing. I cannot talk about the Lovaas model from past generations, so I am going to talk about the model I know, the one that my colleagues were a part of from 1973 to 1984 (Fig. 2.10).

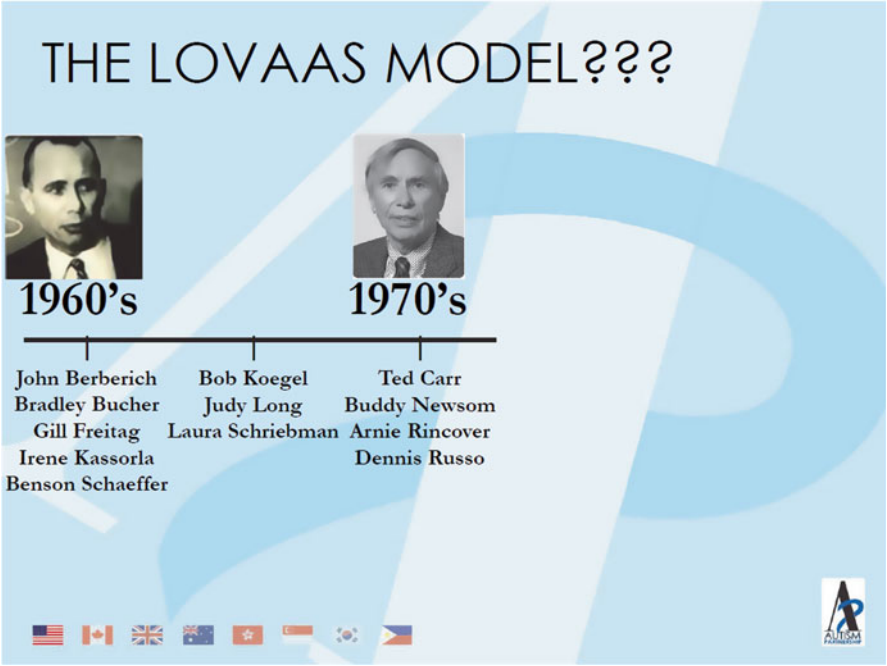


Fig. 2.8 Lovaas Associates during 1970's

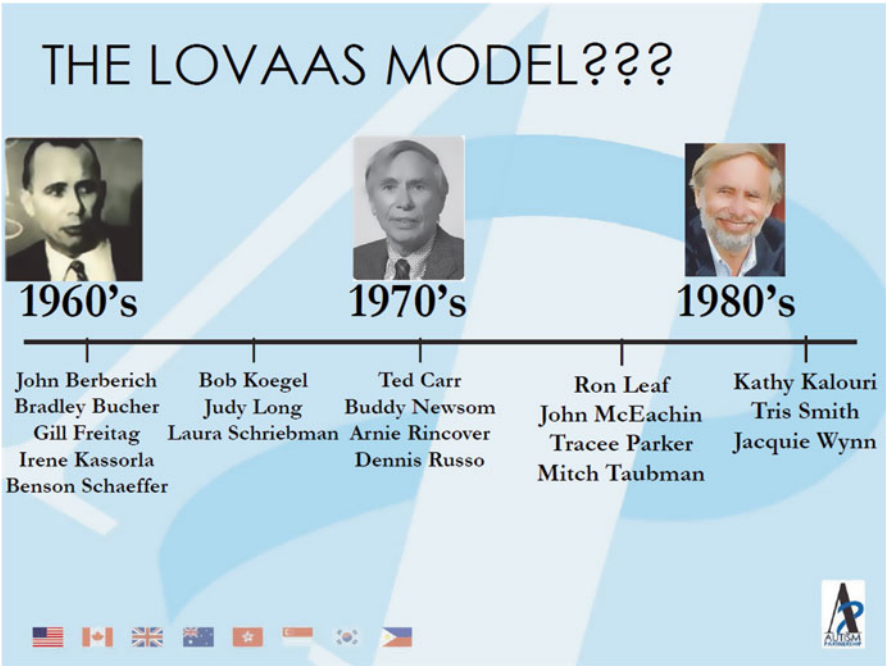


Fig. 2.9 Lovaas Associates during 1980's

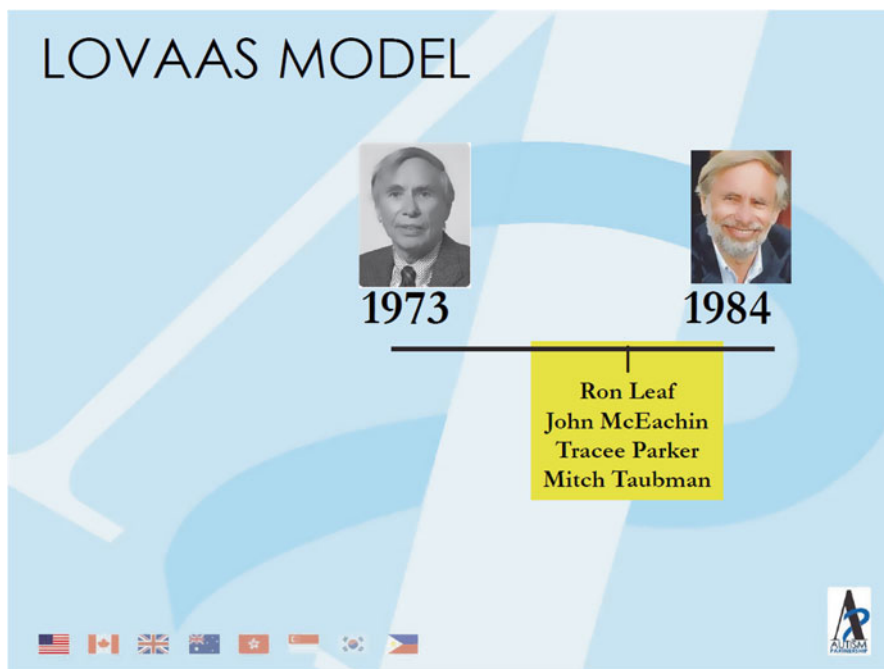


Fig. 2.10 Lovaas Associates during the Leaf and McEachin era

Basic Structure of the Young Autism Project

I want to start by describing the structure at UCLA during my generation (Fig. 2.11).

YAP stands for Young Autism Project. Therapists came from that class I took, Foundations of Behavior Modification. Students that attained a grade of ‘A’ had the opportunity to take a field work class and work directly with the children. They received extensive training and supervision. We used a tiered approach of supervision. Staff received training and supervision from Ivar and Mitch Taubman, who was a post-doc; from the graduate students; from the clinic supervisor; and from the senior therapists. It was intensive and comprehensive.

The people in red indicate staff who are my colleagues at Autism Partnership today.

Our Study: Protocol and Results

I want to describe the protocol, the treatment, and the results (Lovaas, 1987; McEachin, Smith, & Lovaas, 1993). Thirty-eight children participated in the study. They were independently diagnosed with autism. They began treatment before the

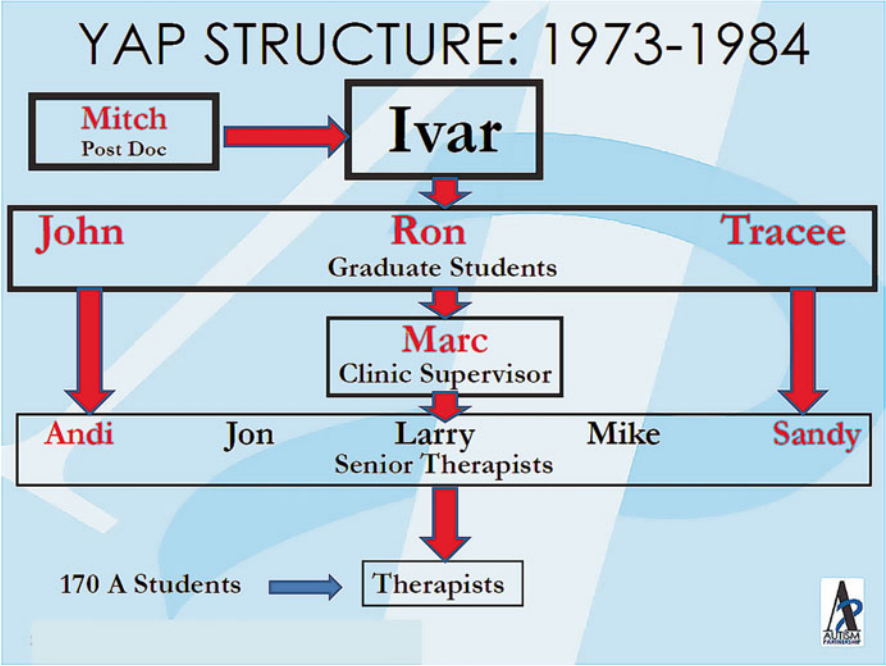


Fig. 2.11 UCLA Young Autism Project Organizational Chart

age of four. Half of the children, 19 of them, received an average of 40 h of ABA weekly. The treatment was broad in scope, encompassing all areas of functioning including language, social, behavior, play, and self-help. We used the principles of ABA to increase desired behaviors and to decrease maladaptive behaviors. Our aim was to have the children engaged in learning and connected with the world around them every minute of the day. The therapy team provided many hours per day of formal intervention. But the rest of the day was equally important and the parents were essential partners in the treatment process. The model was very ambitious, very directive, because the goal was to close the developmental gap. We hypothesized that would only happen if we could speed up the learning process and actively steer the children away from spending their time engaged in narrow interests and repetitive, nonfunctional behavior. If children exhibited disruptive behaviors that greatly interfered with progress, physical punishment was used.

The control group, the other half, received an average of 10 h of ABA weekly as well as other treatments. Punishment was not used with the control group. So it was a comparison of intensity, punishment, and eclectic vs. ABA only. Children received intervention for two or more years and treatment occurred across environments: home, school, and the clinic.

At the end of treatment, all the children were independently evaluated. The outcome criteria of the three groups were based upon IQ, school placement, and diagnosis (Fig. 2.12).

| OUTCOME CRITERIA | | | |
|------------------|---------------------------------|--|------------------------------------|
| | “POOR” | “FAIR” | “BEST” |
| IQ | Profound-Severe | Moderate-Mild | Normal Range |
| School Placement | Classroom for Autistic Disorder | Special Education Other than Autistic Disorder | General Education WITHOUT Supports |
| Diagnosis | Autistic Disorder | Diagnosis Other Than Autistic Disorder | Indistinguishable |

Fig. 2.12 Outcome Criteria from Lovaas (1987) intensive behavioral treatment study

Children whose IQs were in the profound and severe range and/or were in classrooms for autistic disorder and/or still presented with a diagnosis of autism were classified in the “poor group” at follow-up. Children who had IQs in the moderate to mild range and/or were placed in special education other than classrooms for autistic disorder (primarily communication disorder classrooms) and/or presented with a diagnosis other than autism (usually a communication disorder diagnosis) were classified to be in the “fair” outcome group. To be in the best outcome group meant IQs were in the normal range, they were in general education classrooms without supports, and they were indistinguishable. That is they did not present with the behaviors or characteristics diagnostic of autism.

These were the results for the children who received an average of 40 h a week of ABA only and received punishment (Fig. 2.13):

Two children were classified as having “poor” outcomes, eight in the “fair” outcome group, and nine achieved “best” outcomes. In terms of IQ change, the two children in the “poor” group lost an average of 15 IQ points, not surprising given the tests evaluated more abstract concepts. Those children in the “fair” outcome group had a gain of 11 IQ points and the children who were in the “best” outcome group had an average gain of 38 points.

Let us compare it to the control group who received an average of 10 h weekly of ABA, did not receive punishment, and received a variety of treatments including limited ABA (Fig. 2.14).

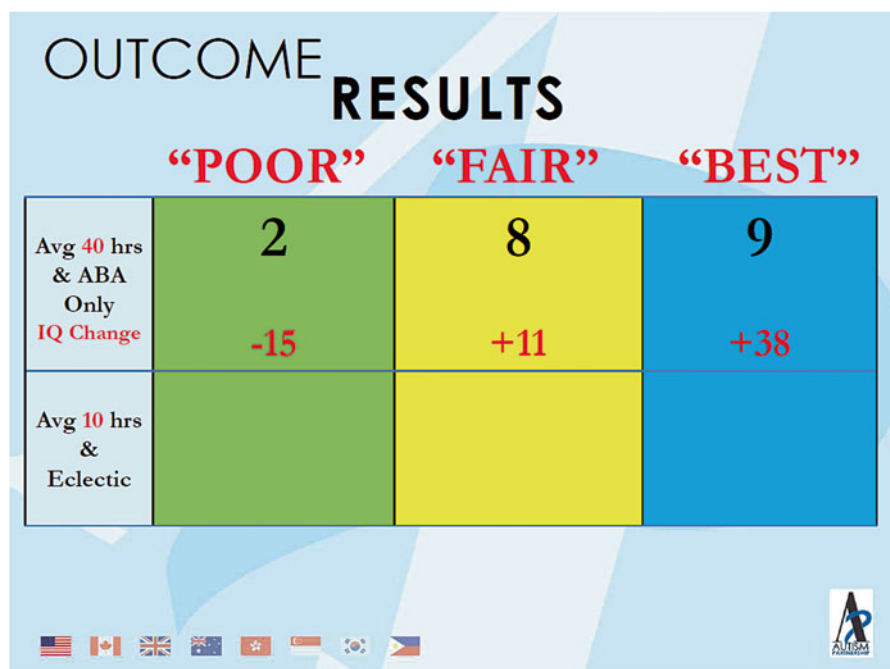


Fig. 2.13 Treatment Outcome for Intensive Treatment Group

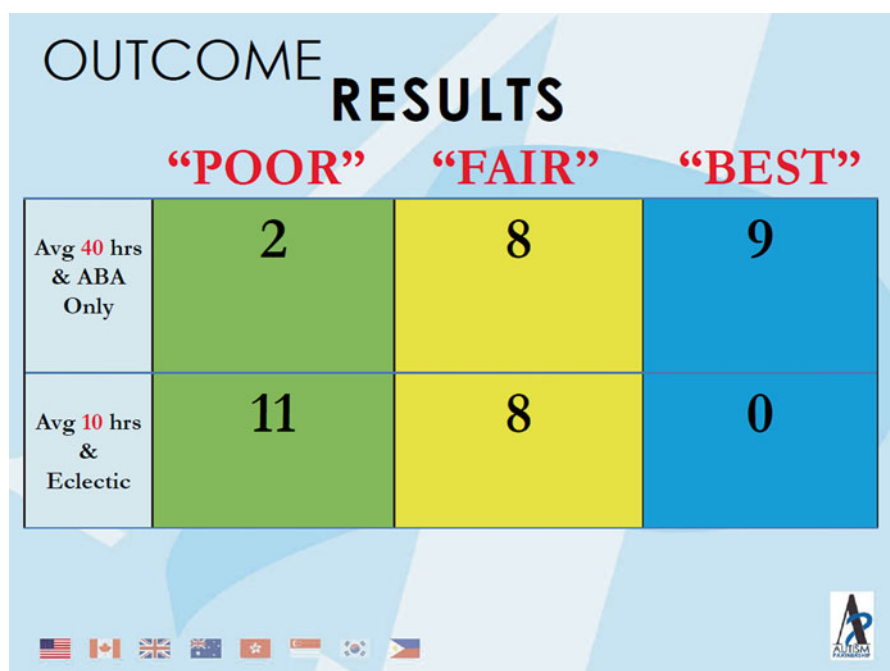


Fig. 2.14 Comparison Between Intensive Treatment vs Comparison Group 1

| OUTCOME RESULTS | | | |
|-----------------------|--------|--------|--------|
| | “POOR” | “FAIR” | “BEST” |
| Avg 40 hrs & ABA Only | 2 | 8 | 9 |
| Avg 10 hrs & Eclectic | 11 | 8 | 0 |
| 0 hrs & Eclectic | 10 | 10 | 1 |

Fig. 2.15 Outcome for Comparison Group 2

Quite striking in comparison. Eleven children, as compared to two were classified in the “poor” outcome group and no children achieved “best outcome” as opposed to nine who were in the experimental group. Our conclusion was that the intensity of treatment combined with punishment resulted in the children moving up one outcome group. Although assignment to treatment condition was not strictly random, we do know that the groups were equivalent on all the important variables related to outcome such as intake developmental level and severity of autistic symptoms. So the less intensive treatment group represents what likely would have been the outcome for children who do not receive more intensive treatment. We suspect that without intensity and punishment, the nine children who achieved “best” outcome would have been in the “fair” group, and the eight in the “fair” group would have been placed in the “poor” outcome group. In essence treatment had significant impact on 17 out of the 19 children.

The results were so remarkable that at the time we were accused of faking our data. That there was no way that nine children with autism, back in the mid-1970s and early 1980s, could have achieved that kind of success.

We had another comparison group that received zero hours from us and were being followed in another study by B.J. Freeman in the medical school at UCLA, and those kids received a variety of interventions in the community, mostly special education classes. Remember this was a time when children did not really have access to ABA treatment and most people were anti-ABA. Here are the results for that comparison group (Fig. 2.15).

The results for the group that did not receive ABA are very comparable to the group who received less intensive ABA treatment, leading us to suspect that receiving 10 h of treatment weekly is not much better than zero hours of treatment.

Let me show you videos of children representative of the two groups, the “fair” and the “best” outcome group. This first clip is representative of a child that achieved “fair” outcome.

VIDEO CLIP #3: <http://www.autismpartnership.com/post/video-links-lovaas-model>

Next is a child that was in the best outcome group.

VIDEO CLIP #4: <http://www.autismpartnership.com/post/video-links-lovaas-model>

Indeed, he did go to college, he got his bachelor’s and master’s degrees, and he did drink the booze. He has a good group of friends and he has a high quality of life. And he was not unique. There were eight other children who had very similar outcomes to him as represented in the data.

The study was important to us for many reasons. One, it greatly changed our expectations. We came to fully believe that children with autism had amazing potential. Of course, it took a great deal of work. It raised the bar for us, in terms of our expectations, and we have even higher expectations today.

Common Myths and Misinterpretations

There are a tremendous number of myths and misinterpretations of the Young Autism Project (Leaf & McEachin, 2008). That is why I have been so obsessed. I want to take this opportunity to clarify the misinformation:

- *All children received a minimum of 40 h a week.* Not true whatsoever; it was an average of 40 h. It ranged from 18 to 60 h. The two children who were eventually placed in the “poor” outcome group received the most hours.
- *We only treated high-functioning children* (Schopler, Short, & Mesibov, 1989). After all if we did not fake the data how else could we have achieved such results? So we must have just treated high-functioning children. But remember the treatment occurred in the 1970s. Children who were “high functioning” would not have received a diagnosis of autism at that time. Also, the functioning levels were comparable in the two groups, so if it was not the treatment that made the difference, the less intensive treatment group should have done just as well.
- *Intervention was exclusively one to one.* One to one was certainly critical. It was the starting point of treatment. But as soon as possible we wanted children to be able to learn in small and then large groups. We needed to get them into school by the time they were five, so that they would be able to be in general education classrooms by First grade at the latest. We strongly believed in intervention being conducted in groups.
- *The treatment was punitive.* Although most of the children did receive physical punishment when they exhibited severe interfering behaviors, they always received far more reinforcement than punishment. And toward the end of the project we were no longer using physical punishment.

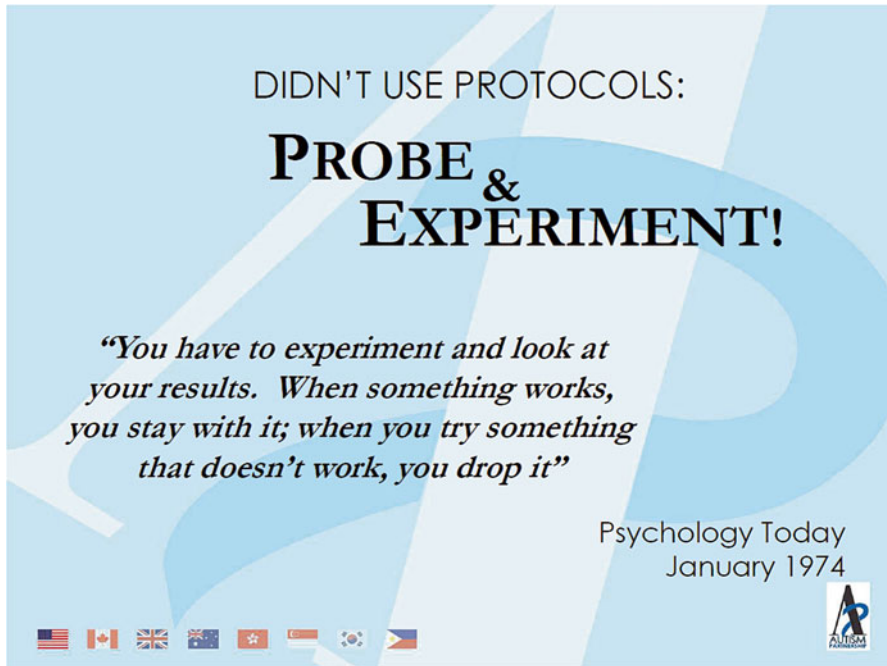


Fig. 2.16 Lovaas' view on protocols

- *Intervention was rigid and protocol driven* (Lipsker, Leaf, & Desio, 1978). Let me assure you, it was not rigid whatsoever. You saw the film from 50 years ago. It was not rigid back then and was not rigid during our generation either. And we were certainly not protocol driven. In fact, Ivar did not believe in protocols. He wanted us to be innovative, creative, and always changing. He wanted us to probe and of course evaluate if what we were doing was effective. If it was not effective then we would change the program. "Do not adhere to protocols!" (Chance & Lovaas, 1974) Similar to an outstanding cook, you may use a recipe as a guide but be creative and improvise as you deem necessary. With the children in the study we had a structure, a plan, but were always willing, encouraged and expected to change so as to meet the needs of our children. Individualization was critical and rigid protocols were antithetical to responding to the unique and ever changing needs of the child (Fig. 2.16).
- *The results are not replicable.* That is probably the number one criticism of the "Lovaas Model"! Indeed, there have been no studies that have achieved the same results. But, was that because we faked the data, or because we hand-selected clients, or that we only treated high-functioning children? I assure you, none of those accusations are true. I strongly believe the results have not been replicated because no one has followed, or perhaps could follow, what was done at UCLA. Let me suggest several factors that make it difficult, if not impossible to replicate the results.

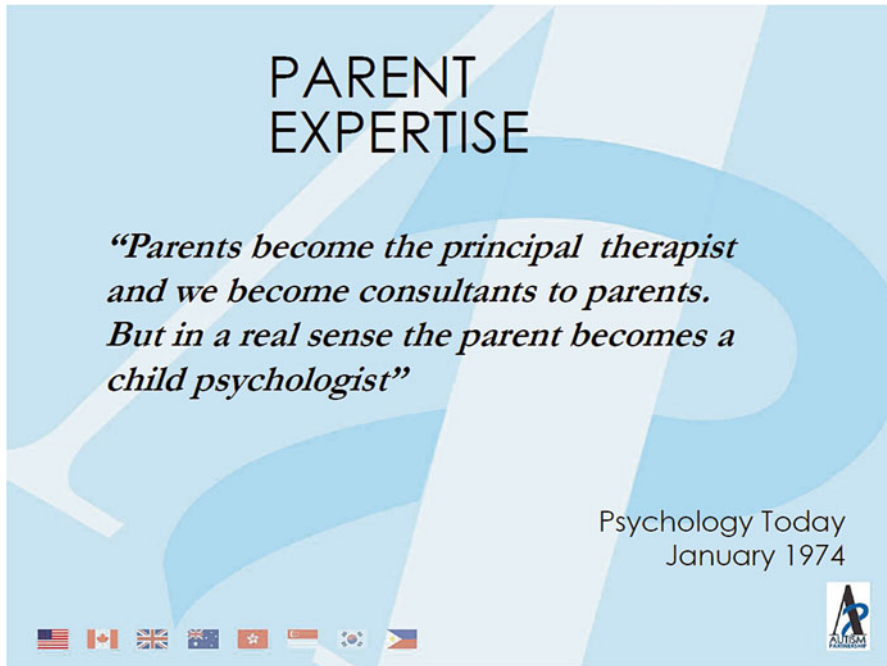


Fig. 2.17 Lovaas’ view on parents’ role

- One has to do with the use of physical punishment. Physical punishment was an important component of the treatment package and there are some things that today are much harder to achieve without the use of strong negative consequences, such as competing with the reinforcing power of self-stimulatory behavior. We stopped using physical punishment, not because it was ineffective; it was incredibly effective. We stopped it because it was not politically correct (Hayes & McCurry, 1990; Maurer, 1983). And today, it is highly unlikely that physical punishment will be used in treatment, at least not in this country. However, the good thing is that it forced us become more creative and more effective in the use of positive reinforcement.
- Parent expertise was absolutely essential. Based upon Ivar’s original outcome study in 1973 (Lovaas et al., 1973) a central emphasis was developing parent expertise. Consequently one of the criteria to participate in the study was that one of the parents had to quit his/her job to be available as a full-time therapist. Our parents were so good at treatment that they helped train our staff. They were so good that during quarter breaks when the undergraduate students were on vacation, our children continued to progress because the parents were doing the treatment. When we implemented a new program, parents would sit down and pilot the program. Ivar commented that we were consultants to the parents; they were their child’s psychologists. And indeed that is how it was (Fig. 2.17).

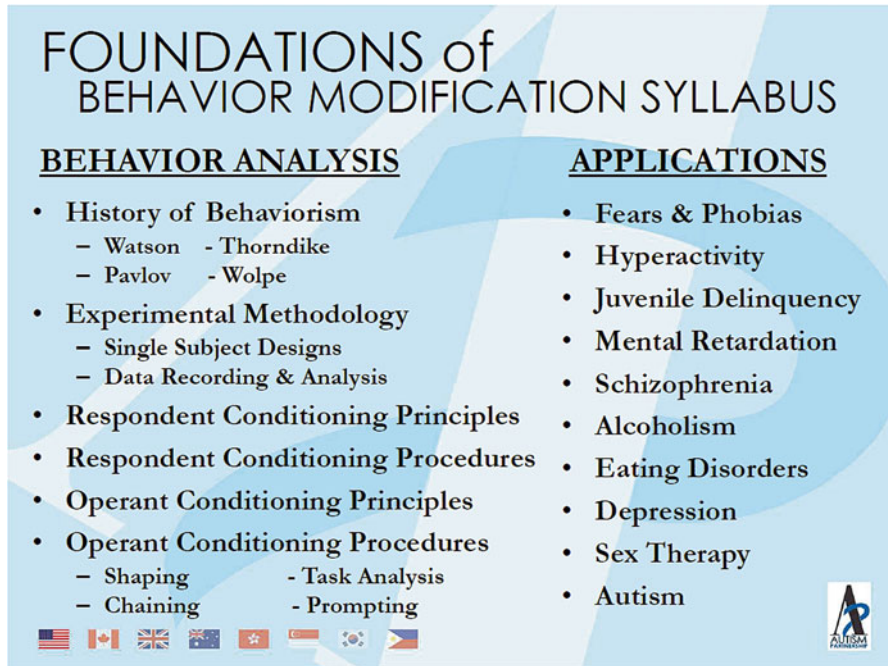


Fig. 2.18 UCLA Course Syllabus

- Another factor which makes replication difficult if not impossible was the level of staff expertise. Ivar was absolutely obsessed, possessed, about staff expertise. He recognized that children's outcomes were directly related to staff expertise. Training started in that Foundations of Behavior Modification class (Fig. 2.18).
- We were taught about the foundations of ABA, the importance of our founding ancestors and about the heart of ABA. We were taught that ABA grew from innovation and the pioneers being willing to be creative and take risks in order to help. We learned about utilizing the full range of behavioral treatment, not just operant techniques, but respondent as well.
- The class was divided into two segments. The first part focused on behavior analysis in which we learned the history of behaviorism, experimental methodology, respondent principles and procedures, and operant as well. The second half of the class turned toward the application of behavior analysis, the applied aspect across numerous populations. Autism was just one part of it.
- Comprehensive training and supervision was provided by Ivar's graduate students. Ivar was a believer that his graduate students needed to have a firm foundation in all of psychology, not just behaviorism. In fact, in graduate school, we rarely took a class in ABA. We learned about other schools of psychology because Ivar was a believer that we needed to have "insight." We needed to have clinical skills. We needed to be able to work with parents and professionals with sensitivity. Critical thinking was a huge emphasis. Not following set protocols




Fig. 2.19 UCLA YAP approach to staff development

meant we have to continually analyze and evaluate our work. Perhaps Ivar's biggest contribution to all the generations was that he created tremendous team unity. It is not surprising that 40 years later many of us are still working together. And this was true of most of the generations. He created teams that fully believed that we would conquer autism (Fig. 2.19).

- Ivar was always extremely concerned about professionals not having the proper expertise in ABA and the damage it would create for children, families, and the field. In 2002, Ivar shared his concern.
- VIDEO CLIP #5: <http://www.autismpartnership.com/post/video-links-lovaas-model>
 - Replicability is extremely difficult since this is an extremely complex model of intervention. The approach was flexible as I have already discussed and because of that it is very difficult to operationalize and certainly could not be distilled into a treatment manual. No protocols. Flexibility was absolutely essential (Lipsker et al., 1978). Ivar was often quoted as saying, “if children can't learn in the way we teach, then we must teach in a way they can learn” (Fig. 2.20).
- We needed to be flexible. And we needed to be critical thinkers. In preparing for this presentation, I uncovered a manual we wrote in 1978 (Lipsker et al., 1978). On one page the word “flexible” appeared seven times (Fig. 2.21).

FLEXIBILITY

*“If a child cannot learn
in the way we teach,
then we must teach in the way
the child can learn.”*














Fig. 2.20 Lovaas' view on teaching

Of of the most important goals in teaching is to be flexible. The ability to move on is not easily accomplished yet is essential to the learning process. Without flexibility goals and expectations may be inappropriate and can only serve to hinder the child's successful progress if they are not changed. With objectivity and flexibility combined you as a teacher can admit mistakes willingly, failure is inevitable. But flexibility enables you to move on, to learn from those mistakes and change. Flexibility enables you to realize that reinforcers and punishers can change, that they are individual as you are. They can be molded and arranged to accommodate any learning situation. To be rigid is to cause the learning process to stand still. To be flexible though is to facilitate learning. Moods can change to fit the situation and formal and informal settings can alter where it's appropriate. With flexibility any situation can be a learning situation and isn't that what teaching is all about.




Fig. 2.21 Draft of teaching manual during YAP era

So, why is the Lovaas model so misinterpreted? Well, these are some possible reasons:

- Often people think of the Lovaas Model as being one of electric shock. Still today, professionals tell me they reject ABA because they do not believe in electric shock. They do not believe in slapping children’s faces! Well neither do we. But that was over 50 years ago when it was the pioneering days of treating ASD (e.g., Lovaas, Schaeffer, & Simmons, 1965). If we are going to evaluate things based on 50 years ago, we would be in trouble. We most likely would not agree to bypass surgery if we observed heart surgery from 50 years ago.
- I think, perhaps, some of the misinterpretations have to do with the *Me Book* (Lovaas, 1981). A book that Ivar and colleagues wrote in the mid-1970s. That was already outdated by the time our generation left. In fact, we stopped using it before it was even published. Ivar saw the book as a book of basic recipes that required adaptation, innovation and analysis. Unfortunately, more than 30 years later people are still using the book as a strict protocol. Meanwhile, critics point to it as evidence of what a bad idea it is to do ABA therapy with children who have ASD.
- I think a great deal of the misinterpretation actually has to do with practitioners in the field that claim they are following the Lovaas model. But in fact they have an extremely narrow interpretation of the model:
 - For example, professionals believe they are following the model when they eliminate distractions (Green, 2001). In schools, children often work in distraction free classrooms: they work in cubicles or behind partitions with reduced noise and interruptions. Home therapy is often conducted exclusively in a therapy room.
 - Well, in reality, Ivar thought we needed to work in the most natural setting possible. He wanted chaos. I remember one case where we sat on the floor, with the TV blaring, and the windows were open so the child could see other children playing outside. Ivar recognized we would not achieve generalization if we did not work in natural environments.
 - There is a false belief that our teaching style was extremely stilted and unnatural. The belief was that we issued one-word instructions, never varied our instructions and used the same tone of voice (Green, 2001). In essence we were robots! However, if we were robots we would not have produced natural language and generalization would not have occurred. Although we were systematic, we strived to be as natural and playful as possible.
 - One on one was certainly central but as I have shared, group work was also essential.
 - Many people think we exclusively used discrete trial teaching, called discrete trial “**training**” back then. Yes, we did rely upon DTT, but we also used other instructional formats as well. We used incidental teaching (Hart & Risley, 1975) and Mitch Taubman brought teaching interactions (Phillips, Phillips, Fixsen, & Wolf, 1974) back from Kansas as another instructional format.

- The Lovaas Model is often associated with the use of food reinforcement and more specifically the use of m&m's. Yes, we often **initially** used food, but we quickly developed toys and activities to substitute for food. More important was using social engagement and developing relationships. Reinforcement development required creativity and not relying on protocols but using what we now call clinical judgment or in-the-moment assessments (Leaf, Kassardjian, et al., 2016; Leaf, Leaf, et al., 2015, 2016; Leaf, Oppenheim-Leaf, et al., 2015; Soluaga, Leaf, Taubman, McEachin, & Leaf, 2008). I will more fully discuss “clinical judgment” when I talk about our work at Autism Partnership.
- As discussed previously, perhaps the biggest misinterpretation was that we followed strict protocols. However, it simply would not have addressed the children's unique needs. It certainly would have been easier to train staff if we had used a set recipe and would have been easier for staff to implement because they would not have to think and adjust. But following strict protocols was not the Lovaas model in our generation and not in previous generations either.
- I think perhaps some of the misinterpretation of the Lovaas Model has to do with Ivar being a controversial figure. He simply loved controversy. One night he was at a dinner with 12 psychiatrists. He stood up, held up a bowl of salad, and then proclaimed that there were more brains in this salad than in the room and then he walked out. That does not get you fans for your approach. In 2004, he made a statement if he had gotten Hitler at the age of four or five he could have made him be a nicer person, maybe even a humanitarian (Ito, 2004) (Fig. 2.22).
- By the way, is not this John B. Watson reincarnated? Ivar was controversial for sure. Unfortunately, this may have contributed to disdain of Ivar's work and led to misunderstanding of the work done at UCLA.

VIDEO CLIP #6: <http://www.autismpartnership.com/post/video-links-lovaas-model>
By the way, that is Don Baer who was speaking in the video clip (Baer, 2002).

Conceptual Basis of the YAP Approach

Now, I am going to share our approach at Autism Partnership. Clearly our roots are grounded from the UCLA Young Autism Project. But prior to founding Autism Partnership in 1994, we had a variety of other experiences (Fig. 2.23).

In the late 1970s, Ivar and I founded Behavior Therapy and Learning Center. The focus of the Center was to provide training and support to parents who had children not only with Autism but also all disabilities. In the early 1980s, we entered into the adult world. For 15 years we provided comprehensive treatment in residential and vocational settings to clients with a variety of disabilities. This was during the days of deinstitutionalization. We were taking adults with severe and persistent behavior problems out of state hospitals and placing them into the community. We learned

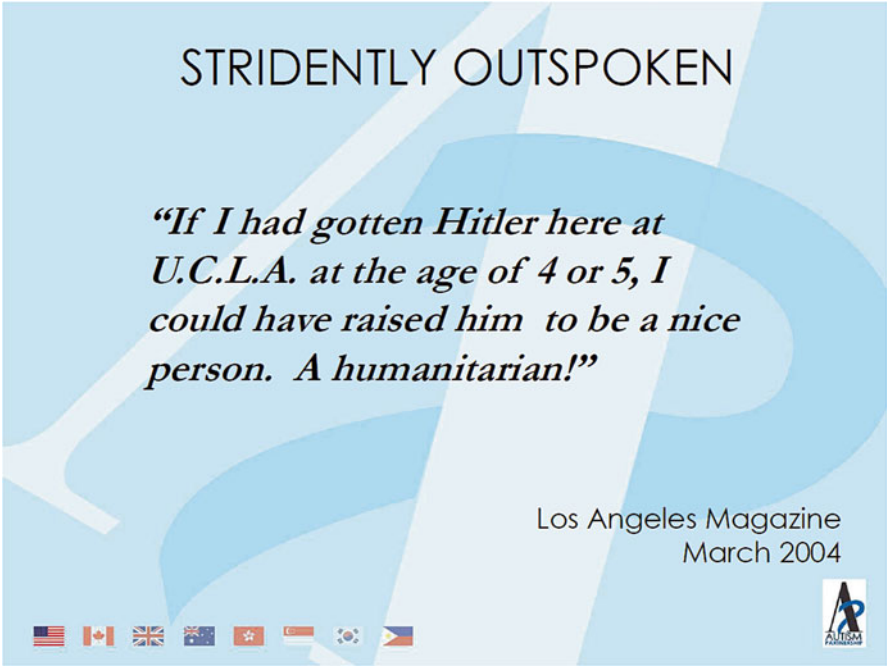


Fig. 2.22 Example of Lovaas’ unbridled rhetoric.

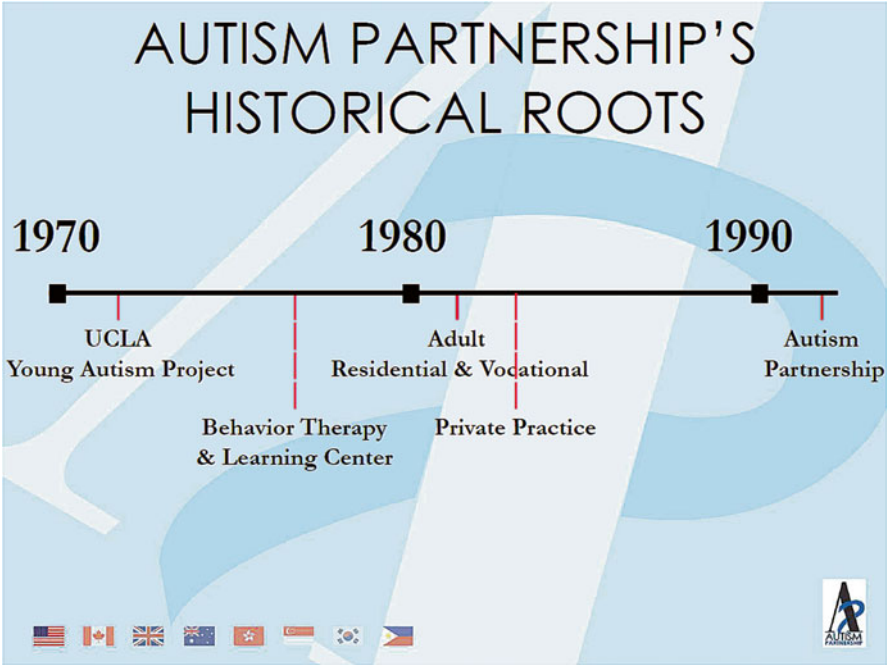


Fig. 2.23 Autism Partnership’s Historical Roots

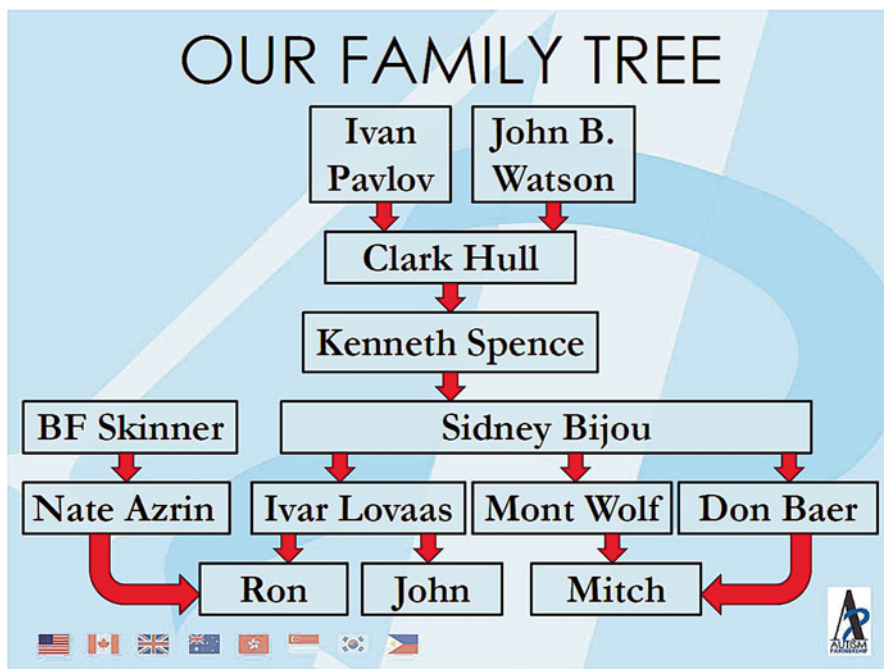


Fig. 2.24 Autism Partnership Family Tree

about priorities and practicality. Working in private practice greatly influenced our “interpretation” of ABA. Working with “normal” neurotic adults, like me, taught us at great deal about sensitivity and using a clinical approach!

Most certainly, our work with Ivar has served as a foundation of our approach at Autism Partnership but working with a variety of ages, from 6 months old to adult, working in a variety of settings, home, schools, state hospitals, clinics, and working with a variety of populations including ASD, Intellectual Disabilities, schizophrenia, and Prader–Willi Syndrome has been invaluable. And of course, our professional fathers, grandfathers, and their ancestors have been vital in shaping our approach (Fig. 2.24).

Our historical roots are vital, but we are constantly evolving and progressing. For example, 5 years ago we went from a mostly home based model to a mostly clinic based program. We have discovered multiple advantages to a clinic based model. By having children in our office we can do school simulation every day helping us to achieve our goal of getting children ready for education in general education classrooms and being able to function there without supports. Perhaps even more important, with a clinic-based model there are increased social opportunities. Children can be with each other all day long. They are eating lunch together, playing, going to the park, and participating in social groups on a continuous basis (Leaf, Taubman, McEachin, Leaf, & Tsuji, 2011). And, we think perhaps the most important part of being a clinic-based model is that we are able to provide our staff with training, supervision and support on a continuous basis.



Fig. 2.25 Autism Partnership Family Tree

Staff Training and Expertise

We are committed to extensive staff development and training, and it starts with the recruiting process. We typically get 100 resumes a week. Out of those 100, we reject 90 and interview only 10. Based on the first interview, we typically ask five to return for a second interview. From those five, we generally invite three applicants to participate in a paid audition for up to 1 month. During this time, we provide them training in the basics of ABA and they observe our work and interact with the children. They get to know us, we get to know them and we are better able to decide if we think it is a good fit. Typically, two applicants make it through the process. At this point they have already received 120 h of training. But now the real training begins! (Fig. 2.25).

Before working independently, a new staff member receives 480 h of training which includes discussions, reading, observations, and working with children under the guidance of supervisors and staff trainers. In order for staff to gain all the skills necessary to make in-the-moment assessments, we feel such training is a critical investment. They have got to be critical thinkers, they have to constantly analyze what is happening, and we feel it will only occur with extensive and comprehensive training. In the book, *Outliers* the author suggested that it takes 10,000 h to become an expert. When it comes to providing quality ABA, we think actually think that is

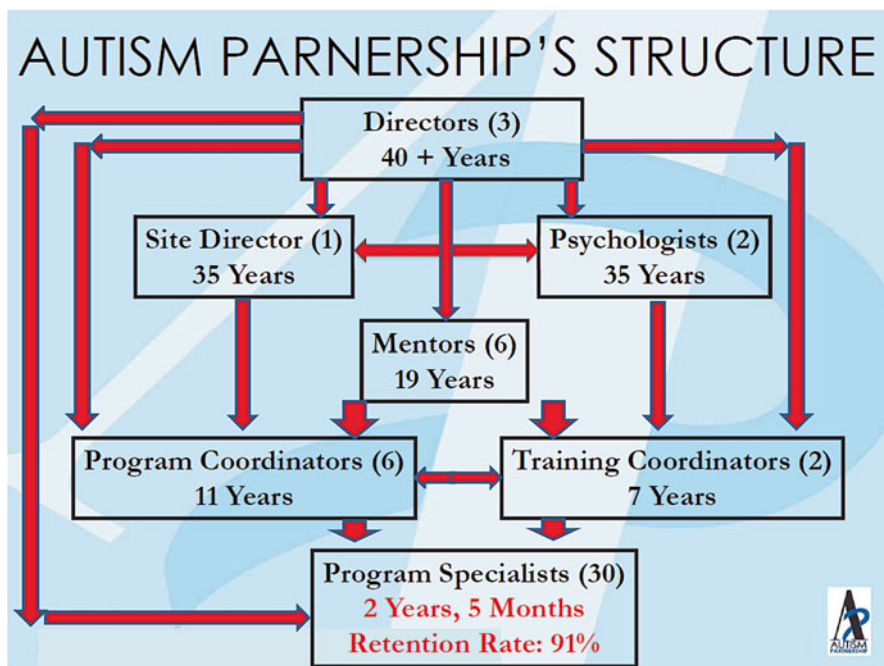


Fig. 2.26 Autism Partnership Organizational Structure

an underestimate. We have found for staff to become extremely skilled it is usually a 5 to 10 year process.

Our structure is very similar to what we had at UCLA. We also use a tiered approach. The advanced clinical staff, the old people, have been together since the mid-1970s. Then we have got the newer staff, our mentors who have been part of AP for 19 years. The next level is our coordinators and supervisors. And then our direct line staff which have a retention rate of 91 % (for staff who complete the training process) (Fig. 2.26).

Role of Parents

Parent buy-in and expertise is essential. When we screen parents we share with them our expectations. We do not want them to become therapists, as we did at UCLA. We want parents to be Mommy and Daddy, not therapists. However, they must become extremely knowledgeable. It is essential that they fully understand, and are supportive of what we are doing. And perhaps most importantly that they embrace ABA and do not do alternative, nonevidence-based treatments (Leaf, Kassardjian, et al., 2016; Leaf, Leaf, et al., 2016). We want them to be able to work with their children on the weekends, not in formal therapy, but to generalize what we are doing.

Primary Procedural Components

These are our phases of intervention (Fig. 2.27).

Obviously every child is different and their treatment plans vary based upon their unique needs. Typically, however, we start off with reducing interfering behaviors. Acting out behaviors such as, aggression, noncompliance, tantrums, or passive behavior problems such as inattention or self-stimulation have to be significantly reduced. Whether it takes 1 day, 1 month, or 1 year we have to address these interfering behaviors in order to successfully teach communication, play, and social skills. Behavior change requires reactive strategies that immediately address the behaviors when they occur. More important are the proactive strategies that teach our children appropriate alternatives and that address the function of the interfering behaviors (Fig. 2.28).

Once interfering behaviors are decreasing, we then target “learning how to learn” skills (Leaf et al., 2011). At UCLA we recognized the importance of teaching children preparatory skills. Today, however we feel it is absolutely essential to teach children how to learn. We think it is taken for granted that children have these skills. However, if a child will not give back their reinforcer or return from breaks, it makes teaching very difficult. They have to learn how to pay attention. That does not mean eye contact, developed through “look at me” drills. Eye contact is just one

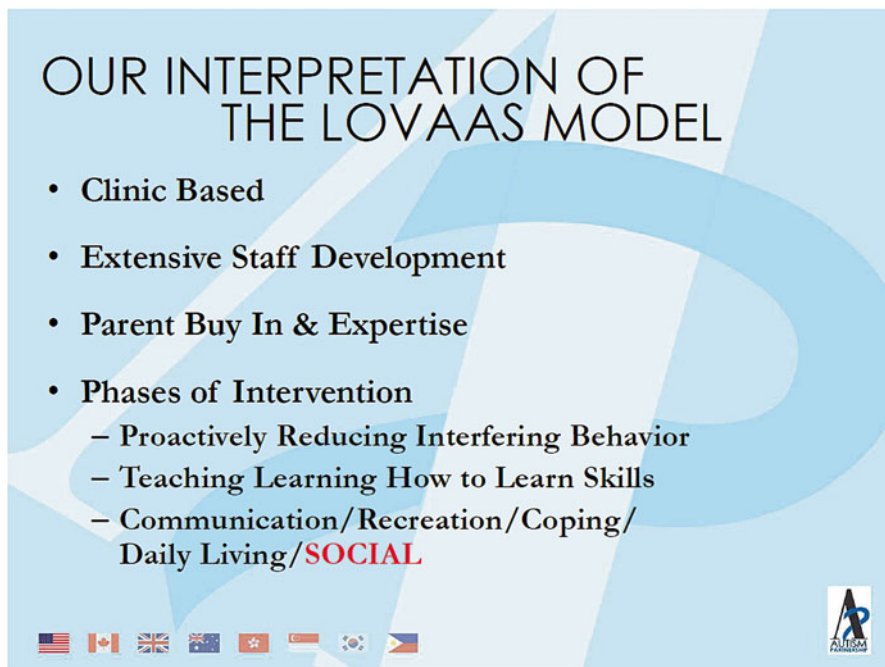


Fig. 2.27 Phases of intervention

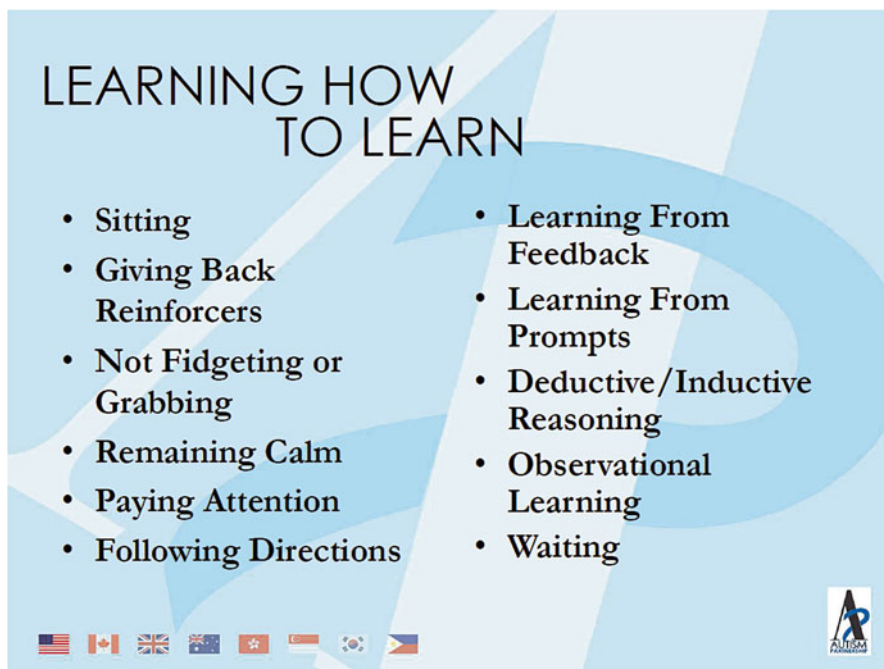


Fig. 2.28 Learning How to Learn

indication of attention. We have to creatively teach children to pay attention. For us it has meant constantly developing new programs. It is essential that children are able to learn from feedback. Most of the children we see do not truly understand feedback. So, when we say to them, “that’s not it,” they are hearing “wa wa wa.” Or we say, “Wow, that’s great.” Again, they are hearing, “wa wa wa.” It has absolutely no meaning. They do not understand the feedback. It may appear that they understand feedback because when they receive reinforcement they are happy and they behave better. But perhaps it is respondent; they are happy and pleased, but do not really understand the contingency. Therefore, we have to teach contingency. Observational learning (Townley-Cochran, Leaf, Taubman, Leaf, & McEachin, 2015) is an important “learning how to learn” skill. In order for our children to be more efficient in the learning process and to be able to learn in groups, they must be taught how to learn observationally. And our children typically have to be taught how to wait. Here are some examples of those programs:

VIDEO CLIP #7: <http://www.autismpartnership.com/post/video-links-lovaas-model>

Once our children have learned the prerequisite “learning how to learn” skills we can then turn toward our more comprehensive curriculum which includes language, social, play, self-help, and stress management—everything a child needs (Leaf & McEachin, 1999). We just do not just treat one aspect of the child, we treat the whole child.

Social is capitalized and in red because we want to emphasize that when teaching our children, social skills are paramount. When children learn social skills they can have meaningful friendships. When all is said and done a child learning to speak or mastering academics is not as important as developing meaningful friendships! Learning social skills simply leads to a higher quality of life, so this is our ultimate objective.

Selecting and Sequencing Goals

How do we make our decisions, how do we select our curriculum? Well, we do not use paper and pencil tests unless we are doing research. We are looking child by child, and there are multiple factors that help us decide what curriculum to use (Fig. 2.29).

These are just some of the factors that we consider: What behaviors are interfering with the learning process? What skill deficits do they have? We look at the chronological age as well as the developmental age of our clients. What skills would help increase their understanding of feedback? We are looking at what skills would be motivating for the child to learn. What would *he* want to learn? What excites



Fig. 2.29 Considerations in Selection of Curriculum



Fig. 2.30 Autism Partnership research themes

him? Also, what skills are important for his parents? What do *they* want their child to learn? We look at skills that would help accelerate communication and allow the child to experience the power of communication, so he will *want* to communicate. Every child’s curriculum is very different because the children are all different.

The Evidence Base

We are evidence-based. We hear “evidence-based” used a lot. But we are not quite sure what that means anymore. We hear so many things claiming to be “evidence-based” even though there is no controlled research demonstrating effectiveness. We only accept as evidence-based those procedures and outcomes that have been published in scientific journals.

We have to credit Justin Leaf for being the driving force of our Research Department. When he joined Autism Partnership 5 years ago we had two publications. Now we have more than 40!

These are our research themes (Fig. 2.30):

We do procedural studies investigating teaching techniques. Such studies include examining prompting strategies (Leaf, Leaf, Alcalay, et al., 2014; Leaf, Leaf,

Taubman, McEachin, & Delmolino, 2014; Soluaga et al., 2008) comparing errorless learning, versus “no, no, prompting” versus flexible prompt fading (Leaf, Sheldon, & Sherman, 2010). We have examined the effectiveness of group intervention as contrasted with 1:1 (Leaf et al., 2013). We have conducted studies examining various procedures to teach our children social skills (Leaf, Oppenheim-Leaf, et al., 2012; Leaf, Tsuji, et al., 2012).

We also do what we call “antiestablishment” studies. Looking at procedures that are widely used in ABA and examining if they are truly effective. We researched different data collection procedures (Taubman, Leaf, McEachin, Papovich, & Leaf, 2013). Many professionals consider continuous data collection to be the gold standard. But is it really necessary and are there disadvantages? Our study suggested that perhaps there are better alternatives. Recently, we examined reinforcer preference assessments (Leaf, Leaf, et al., 2015; Leaf, Oppenheim-Leaf, et al., 2015), once again considered the gold standard, to identify effective reinforcers. Our data indicate that it is not often necessary to do formal preference assessments and more importantly it significantly reduces trials of learning. Social Stories are often being used by BCBA’s but are they really effective? Our research indicates that Teaching Interactions, developed decades ago at the University of Kansas are far more effective as a strategy. When examined carefully, Social Stories unless accompanied by other teaching strategies turn out to be largely ineffective (Kassardjian et al., 2014; Leaf, Leaf, et al., 2015; Leaf, Oppenheim-Leaf, et al., 2012, 2015; Leaf, Tsuji, et al., 2012).

In 2011, we did a program evaluation looking at what we did, not an experimental study but rather a descriptive study (Leaf et al., 2011). We wanted to evaluate the effectiveness of our approach across four of our offices (US, Hong Kong, UK, and Australia). We used outcome criteria that were similar to what we used at UCLA (Fig. 2.31).

Forty-five out of sixty-four children achieved what we considered “best outcome.”

Clinical Judgment: In the Moment Assessment

Clinical judgment is perhaps that most important aspect of our approach at Autism Partnership (Leaf, Kassardjian, et al., 2016; Leaf, Leaf, et al., 2016). We are continuously making in-the-moment assessments, meaning we are analyzing second-by-second what to do, not being protocol driven. Not being a slave to the recipe, but altering the recipe continuously.

Why clinical judgment? Well, because it is not black and white. And our children do not read the protocols. Why clinical judgment? Stokes & Baer’s, 1977 article, one of my favorite articles in ABA, discussed how to achieve generalization. What they suggested is the same thing we mean when we say clinical judgment, continuously altering intervention. Why clinical judgment? Because Ivar taught us that is was an essential part of effective treatment. And the results we get are better when interventionists use their brain, than when they mindlessly follow protocol.

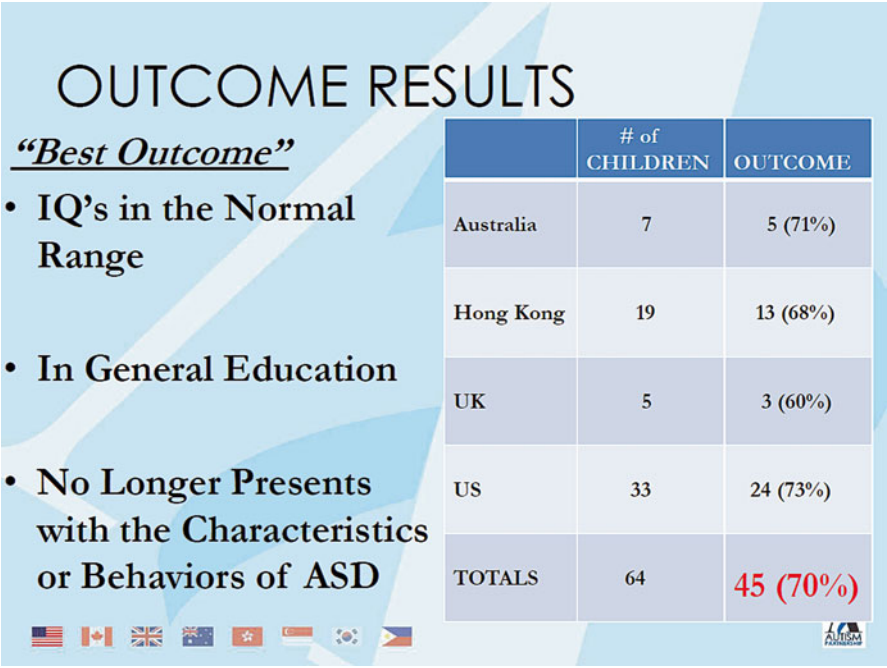


Fig. 2.31 Outcome classification for children receiving treatment at Autism Partnership

These are just some examples of in-the-moment assessments we are making (Fig. 2.32):

Complexity of teacher’s language: Should our language be simple? Or should it be complex? Or in between? In reality, it often changes second by second and certainly child by child. Should the therapist select the reinforcers or the child? Or should we just probe and analyze the effect on the child’s behavior and performance? Prompting strategies: Which one should we use? Well in reality there is no really one correct strategy. There are several effective prompting strategies and it changes moment by moment. What should be the targets? Which data collection procedure? In reality we do not often need to be collecting trial-by-trial data. We are killing too many trees! We can often take representative samples of data or simply do estimations and obtain valid summaries. We have to take data, but we have to first decide which collection procedure is optimal and reevaluate based upon clinical judgment (Fig. 2.33).

These are just some of the factors that we need to consider when making decisions—that is, the factors that influence our in-the-moment assessments, our “clinical judgment.” Is the behavior operant or respondent? Because if it is respondent we should react very differently. What are the interfering behaviors? What is the function of behaviors? And there are certainly more than four possible functions of behavior. The current attentiveness of the child is essential in the decision-making process.

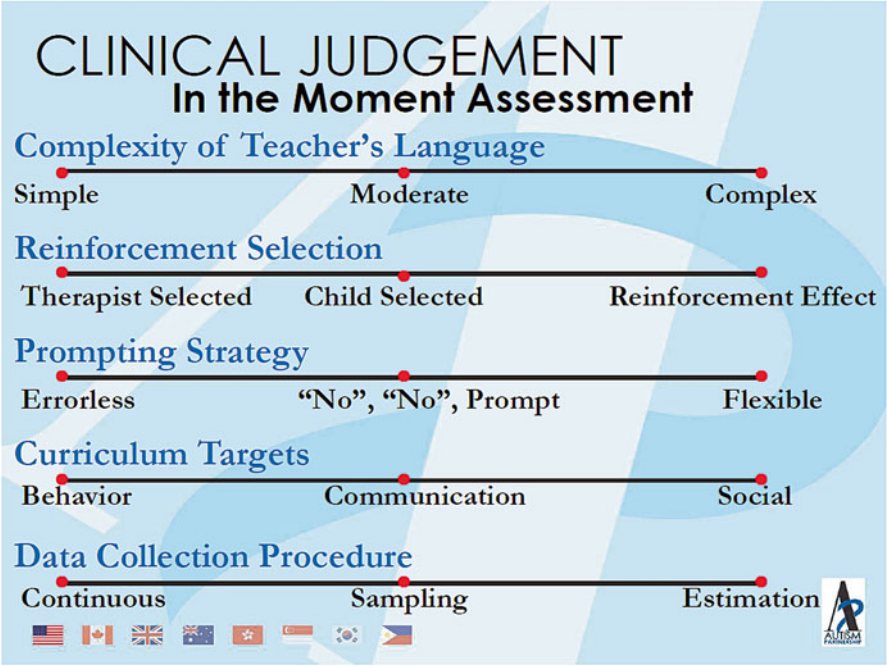


Fig. 2.32 In-the-moment decision making by interventionists



Fig. 2.33 Considerations that Factor into Clinical Judgment



Fig. 2.34 Anthony Cuvo, mentor and chef

We look at their responsivity. Are they calm or agitated? We analyze their recent performance as well as their past performance. We need to assess their current motivation. We have to carefully analyze their nonverbal behavior. Their facial expressions and their body language tell us everything. We have to consider the staff that is working with them. What is their skill level? Do they have 30 years of experience or are they relatively new? What the child's level of persistence? And of course their health is a huge factor: how did they sleep, are they feeling well, are they hungry? These factors and many more should influence our clinical judgment. Obviously, to be able to make in-the-moment decisions, to use clinical judgment, means staff need comprehensive, intensive and ongoing training, supervision, and support!

When I think of clinical judgment, I think of this gentleman, Tony Cuvo, my mentor at Southern Illinois University (Fig. 2.34).

Tony taught his graduate students how to cook. We wondered why that was important. It seemed crazy! For me it was career changing. With tremendous resistance, I learned the importance of not following a recipe, I learned about not following protocols. I learned to use a recipe as a base but then improvise. There was a method to his madness (and I learned how to cook, too).

John Wooden, Muhammad Ali, Meryl Streep, Taylor Swift, and Robin Williams. What makes these people unique besides being amazing at what they do? The only



Fig. 2.35 Clinical judgment in all walks of life

one you may not know is John Wooden who I believe is the greatest coach of any sport! What makes them unique? They all used clinical judgment. Muhammad Ali, the best fight ever, he often fought with no fight plan, constantly changing his strategy based upon his clinical judgment. Robin Williams, obviously brilliant, clinical judgment.

Nate Azrin, Don Baer, Jim Sherman, Todd Risley, Mont Wolf, and Ted Ayllon—these are some of my heroes in the ABA world; they were the heart of ABA. They all used clinical judgment. They were all creative. They were all innovative. They did not follow protocols. That is the essence of ABA, just conquering the disorder, being brilliant. Ted Ayllon, developing the token economy, had no game plan, no protocol; he just probed and came up with it.

My family exudes clinical judgment. My son, Justin is a brilliant researcher because he uses clinical judgment. My middle son Jeremy is a wonderful therapist, he uses clinical judgment. My youngest son Cole is a pitcher and he uses clinical judgment, deciding what pitch to throw, what arm angle to use. My wife, Jamie is a brilliant therapist, she uses clinical judgment. She reads body language and facial expressions and how couples look at each other. This is what it takes to be outstanding. This is what it takes to make differences (Fig. 2.35).



Fig. 2.36 Let's stop the insanity

Conclusion

Similar to Ivar we too are controversial, perhaps thought provoking. Maybe that is what it takes to stop the insanity in the world of ABA. Here is what I mean by insanity (Fig. 2.36):

We have actually had articles rejected because they are innovative. Journals have actually rejected articles because there has not been any research that had shown a new procedure to be effective! Of course there is none, we are doing the research. Operant bigotry: I am sad that in graduate school these days, people are not learning about respondent conditioning. And although respondent conditioning is a major factor in our children's behaviors it is being neglected. And Behaviorists are using Social Stories and Social Thinking! (Leaf, Kassardjian, et al., 2016; Leaf, Leaf, et al., 2016)! Really? Where is the research for those approaches? It is sad, it is tragic. Continuous data—where is the evidence that we need continuous data? Prolonged FBAs: for gosh sakes, most FBAs can be done in minutes. Of course, there are times a more extensive FBA is necessary but often not. And we are often endangering children with prolonged FBAs. Preference assessments? Do not get me started. And there are still debates about recovery, for God sakes. I do not get it! There is research, independent research, showing recovery does happen. Maybe recovery is not a good term and yes, we need to be careful about promoting recovery



Fig. 2.37 It Has to Be Said–Again

as a selling point for ABA. But the reality is that a significant subset of children can achieve “recovery.” Maybe we should use a different term than recovery, but if a child’s IQ is in the normal range, if they are in general education, and they do not present with autism, call it what you want; but it is a very significant outcome!

There is no Lovaas model, plain and simple. Obedience and set protocols drive us crazy.

And, finally, and probably most importantly, not using qualified practitioners is **INSANITY**. We fully understand that there is a need for therapists. We get it, but we would not let a flight attendant fly a plane with the pilot checking in on her every now and then (Leaf et al., [In Press](#)). We would not have a school nurse do surgery. In the same way, we must have qualified interventionists doing intervention. We have had an office in England for 15 years. Initially, services were funded by the local educational authorities. After a few years, they stopped funding services. Why? Because they did a study in which unqualified therapists provided intervention and naturally the results demonstrated that “ABA was ineffective.” So for years ABA was not funded until people began to understand the effectiveness of ABA is dependent upon the training of the interventionist.

Finally, our interpretation of the Lovaas model is that by providing the highest quality of therapy children with ASD can make amazing progress! I hope these before and after video clips will demonstrate the progress that children can make. You will see the first few minutes of intervention and then 10 weeks later:

VIDEO CLIP #8: <http://www.autismpartnership.com/post/video-links-lovaas-model>

And here are the same children 2 years later:

VIDEO CLIP #9: <http://www.autismpartnership.com/post/video-links-lovaas-model>

Thank you so much for coming and listening. I greatly appreciate it and I am so honored to be on a panel with these presenters. I know it is going to be a great day listening to them, as well. Thank you so much.

References

- Baer, D. M. (2002). *Celebration of Donald M. Baer*. Paper presented at the celebration of Donald M. Baer, Lawrence, Kansas.
- Chance, P., & Lovaas, I. (1974). After you hit a child, you can't just get up and leave him; You are hooked to that kid. Conversation with Ivar Lovaas. *Psychology Today*, 7, 76–84.
- Green, G. (2001). Behavior analytic instruction for learners with autism advances in stimulus control technology. *Focus on Autism and Other Developmental Disabilities*, 16, 72–85.
- Hart, B., & Risley, T. R. (1975). Incidental teaching of language in the preschool. *Journal of Applied Behavior Analysis*, 8, 411–420.
- Hayes, L. J., & McCurry, C. A. (1990). Moral and scientific aspects of the punishment controversy. In A. C. Repp & N. N. Singh (Eds.), *Perspectives of the use of nonaversive and aversive interventions for persons with developmental disabilities* (pp. 87–102). Sycamore, IL: Sycamore.
- Ito, R. (2004, April). The phantom chaser. *Los Angeles Magazine*, 50–57.
- Kassardjian, A., Leaf, J. B., Ravid, D., Leaf, J. A., Alcalay, A., Dale, S., ... Oppenheim-Leaf, M. L. (2014). Comparing the teaching interaction procedure to social stories: A replication study. *Journal of Autism and Developmental Disorders*, 44, 2329–2340.
- Leaf, J. B., Kassardjian, A., Oppenheim-Leaf, M. L., Cihon, J. H., Taubman, M., Leaf, R., & McEachin, J. (2016). Social thinking®: Science, pseudoscience, or antisience? *Behavior Analysis in Practice*.
- Leaf, J. B., Leaf, J. A., Alcalay, A., Dale, S., Kassardjian, A., Tsuji, K., ... McEachin, J. (2014). Comparison of most-to-least to error correction to teach tacting to two children diagnosed with autism. *Evidence-Based Communication Assessment and Intervention*, 7, 124–133.
- Leaf, J. B., Leaf, R., Alcalay, A., Leaf, J. A., Ravid, D., Dale, S., ... Oppenheim-Leaf, M. (2015). Utility of formal preference assessments for individuals diagnosed with autism spectrum disorder. *Education and Training in Autism and Developmental Disabilities*, 50, 199–212.
- Leaf, J. B., Leaf, R., McEachin, J., Taubman, M., Ala'i-Rosales, S., Ross, R. K., ... Weiss, M. J. (2016). Applied behavior analysis is a science and, therefore, progressive. *Journal of Autism and Developmental Disorders*, 46, 720–731.
- Leaf, J. B., Leaf, R., McEachin, J., Taubman, M., Smith, T., Harris, S. L., ... & Waks, A. (In Press). Concerns about the registered behavior technician™ in relation to effective autism intervention. *Behavior Analysis in Practice*.
- Leaf, J. B., Leaf, R., Taubman, M., McEachin, J., & Delmolino, L. (2014). Comparison of flexible prompt fading to error correction for children with autism spectrum disorder. *Journal of Developmental and Physical Disabilities*, 26, 203–224.
- Leaf, R. B., & McEachin, J. J. (1999). *A work in progress: Behavior management strategies and a curriculum for intensive behavioral treatment of autism*. New York, NY: Different Roads to Learning.
- Leaf, R. B., & McEachin, J. (2008). The UCLA Young Autism Project (YAP). In R. Leaf, J. McEachin, & M. Taubman (Eds.), *Sense and nonsense in the behavioral treatment of autism: It has to be said*. New York, NY: Different Roads to Learning.
- Leaf, R. B., McEachin, J. J., & Taubman, M. (2008). *Sense and nonsense in the behavioral treatment of autism: It has to be said*. New York, NY: DRL Books.

- Leaf, J. B., Oppenheim-Leaf, M. L., Call, N. A., Sheldon, J. B., Sherman, J. A., Taubman, M., ... Leaf, R. (2012). Comparing the teaching interaction procedure to social stories for people with autism. *Journal of Applied Behavior Analysis*, 45, 281–298.
- Leaf, J. B., Oppenheim-Leaf, M. L., Leaf, R. B., Taubman, M., McEachin, J., Parker, T., ... Mountjoy, T. (2015). What is the proof? A methodological review of studies that have utilized social stories. *Education and Training in Autism and Developmental Disabilities*, 50, 127–141.
- Leaf, J. B., Sheldon, J. B., & Sherman, J. A. (2010). Comparison of simultaneous prompting and no-no prompting in two-choice discrimination learning with children with autism. *Journal of Applied Behavior Analysis*, 43, 215–228.
- Leaf, R. B., Taubman, M. T., McEachin, J. J., Leaf, J. B., & Tsuji, K. H. (2011). A programmatic description of a community-based intensive behavioral intervention program for individuals with autism spectrum disorders. *Education and Treatment of Children*, 34, 259–285.
- Leaf, J. B., Tsuji, K. H., Griggs, B., Edwards, A., Taubman, M., McEachin, J., ... Oppenheim-Leaf, M. L. (2012). Teaching social skills to children with autism using the cool versus not cool procedure. *Education and Training in Autism and Developmental Disabilities*, 47, 165–175.
- Leaf, J. B., Tsuji, K. H., Lentell, A. E., Dale, S. E., Kassardjian, A., Taubman, M., ... Oppenheim-Leaf, M. L. (2013). A comparison of discrete trial teaching implemented in a one-to-one instructional format and in a group instructional format. *Behavioral Interventions*, 28, 82–106.
- Lipsker, L. E., Leaf, R. B., & Desio, C. L. (1978). *Good looking: A handbook of behavior modification*. Los Angeles, CA: Unpublished Manual.
- Lovaas, O. I. (1981). *Teaching developmentally disabled children: The me book*. Austin, TX: PRO-ED Books.
- Lovaas, O. I. (1987). Behavioral treatment and normal educational and intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology*, 55, 3–9.
- Lovaas, O. I., Koegel, R., Simmons, J. Q., & Long, J. S. (1973). Some generalization and follow-up measures on autistic children in behavior therapy. *Journal of Applied Behavior Analysis*, 6, 131–166.
- Lovaas, O. I., Schaeffer, B., & Simmons, J. Q. (1965). Building social behavior in autistic children by use of electric shock. *Journal of Experimental Research in Personality*, 1, 99–109.
- Lovaas, I. O., & Simmons, J. Q. (1969). Manipulation of self-destruction in three retarded children. *Journal of Applied Behavior Analysis*, 2, 143–157.
- Maurer, A. (1983). The shock rod controversy. *Journal of Clinical Child Psychology*, 12, 272–278.
- McEachin, J. J., Smith, T., & Lovaas, O. I. (1993). Long-term outcome for children with autism who received early intensive behavioral treatment. *American Journal on Mental Retardation*, 97, 359–372.
- Moser, D., & Grant, A. (1965, May). Screams, slaps and love. *Life*, 58(18), 90–101.
- Phillips, E. L., Phillips, E. A., Fixsen, D. L., & Wolf, M. M. (1974). *The teaching-family handbook*. Lawrence, KS: University of Kansas Printing Service.
- Schopler, E., Short, A., & Mesibov, G. (1989). Relation of behavioral treatment to “normal functioning”: Comments on Lovaas. *Journal of Consulting and Clinical Psychology*, 57, 162–164.
- Soluaga, D., Leaf, J. B., Taubman, M., McEachin, J., & Leaf, R. B. (2008). A comparison of flexible prompt fading and constant time delay for five children with autism. *Research in Autism Spectrum Disorders*, 2, 753–765.
- Stokes, T. F., & Baer, D. M. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis*, 10, 349–367.
- Taubman, M. T., Leaf, R. B., McEachin, J. J., Papovich, S., & Leaf, J. B. (2013). A comparison of data collection techniques used with discrete trial teaching. *Research in Autism Spectrum Disorders*, 7, 1026–1034.
- Townley-Cochran, D., Leaf, J. B., Taubman, M., Leaf, R., & McEachin, J. (2015). Observational learning of students diagnosed with autism: A review paper. *Review Journal of Autism and Developmental Disorders*, 2, 262–272.

Comprehensive Models of Autism Spectrum Disorder
Treatment

Points of Divergence and Convergence

Romanczyk, R.G.; McEachin, J. (Eds.)

2016, XVIII, 149 p. 54 illus., 42 illus. in color., Hardcover

ISBN: 978-3-319-40903-0