# BEYOND REDUCTIONISM: DIRECTIONS TOWARD UNDERSTANDING CHILDREN

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I saw this recently in Japan, but the same type of planning for young children is common in the United States. A kindergarten, in many ways quite a good kindergarten, took a bus load of 4-year-olds on a field trip to a factory. This field trip had some very attactive features: the mother of every child was able to attend, the factory makes a product which children tend to enjoy and consume, and, not insignificantly, there was no cost involved, even the bus was provided by the factory. This should have been a clue. Factories are owned by commercial, that is, profit making, companies.

The trip was to take the entire morning, so there were no other plans to engage the children. The place to catch the bus was not near the center. The bus was late, about 30 minutes. The bus, designed for adults rather than children, was without seat belts, but it included a hostess as well as the driver. The travel route was through heavily congested city streets and the ride lasted 30 minutes or more. On the bus, attendance was taken and songs were sung, including two with large teacher-made books held in the front of the bus so the children could follow as they sang. The factory was new and handsome, and included, so it seemed to me, the latest in technology. The factory was also designed for tours. We were welcomed by the usual bowing workers, then taken to a room full of adult-size tables and chairs. On the tables in front of every chair was a wrapped straw. Soon a woman introduced herself as our tour guide. The tour would now begin. We left the straws, and our guide lead us up a short stairway and down a hallway to a section with solid windows on both sides from which we could look at the machines below. Small items were moving in various directions while a few people in white coats and facial coverings watched the machines and occasionally did something. Then we were guided along to another room to see a TV show about this factory's products. After that we returned down the same hallway and stairway, back to the room with the tables, chairs and straws. Now next to each straw was a small bottle of drink. We drank. Then the windowshades closed automatically, and the room became dark. The children made it-has-suddenly-gotten-dark sounds. Then a movie began, a cartoon about a boy and two vitamins who travel down a throat and into a stomach where they watch a battle (with we-are-watching-a-battle sounds from the children) by the bad bacteria and the good bacteria or some-

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thing like that. The movie concluded with telling everyone what needs to be in every child's breakfast: toast (not rice!), egg, ham (or something that looked to me like ham), cucumber, and the drink with the two vitamines. This was followed by a movie of one of the 100-year-old twin women, the one who has drunk this drink for 30 years. The movies ended. On our way out we were given bags of some of their products (including a can of fruit drink with 20% natural fruit juice) and advertizing material. Those who needed to went to the toilet. Photos were taken outside with the company bus as the background. A soccer ball (or do you call it a football?) and cases of more drinks were given to the director to take back to the kindergarten. We got on the bus for another 30 (or more) minute ride. During this trip a child spilled hot tea on himself, which hurt for awhile, but did no damage. More songs were sung, including some sung by children with the bus microphone, karaoke style. We arrived back at the place where we had caught the bus, two and a half hours before. We said goodbye to the hostess and the driver, collected all of our things, and got off the bus. The trip was over, and the bus drove away. But the children were thirsty, so the bottles were opened and drunk. Then the children and the mothers took a short walk to a pleasant, shaded area and had a picnic lunch.

All in all, it was a most successful trip. The children couldn't have behaved better. Other than the minor incident with the tea, there were no problems. Or were there? Let's look at this trip from other points of view. These are 4-year-olds. A major characteristic of children this age is large motor physical activity. Children this age need and want to run and chase—start, stop, turn, duck, as fast as they can. But this trip required them to wait for the bus (some of the children were able to run a bit during this time), to climb on the bus, to sit in adult size seats on the bus, to walk together into the hallway of the factory, to sit in a room with adult size furniture, to walk up stairs and along a hallway, to stand and look at a room below, to sit and watch TV, to walk along the hallway and down the stairs, to sit in the room with adult furniture and watch a movie, to walk to the toilets, to walk outside, to wait while photos were being taken, to sit on the bus, to climb off the bus, and then to walk to the area for the picnic lunch where they sat and ate. Some of these activities extended for considerable lengths of time.

Another major characteristic of children this age is investigation and manipulation of physical objects. Children touch, poke, move, lift, drop, throw, twist what they can get their hands on, and they search for every possible object to explore with their hands and their minds. Except for the snacks the children brought from home and first the straw—by itself!—and then the drink, there was nothing for the children to do with their hands. Possibilities contained in the bus were effectively curtailed through close adult supervision.

For children who characteristically run and explore with their hands, how can they engage in such extended, controlled motor activities. There are a number of explanations. First, their mothers were all there, providing directions and encouragement and, when needed, food, drink, and physical contact to help relieve tensions. Second, this was a special event-only two trips a year. So the children probably knew that they had to behave especially well; they may have been told this explicitly by

their mothers and by their teachers. Third, they were probably familiar with the factory product and hoped that they might have some to drink while they were there, so they had to be good, otherwise they might not get their drink. Fourth, it was a large group and everyone else was doing the same things at the same times, all reinforced by teachers and mothers; there were no deviating models present. And fifth, except for the straw and drink and toilets, there was absolutely nothing for the children to get their hands on. Even all the surfaces were hard, cold, and plain, obviously designed for ease of cleaning and people flow.

All of the children's activities were adult prescribed and controlled. Waiting for adults; using a bus and a building made for adults by adults and without any modifications to make them more fitting for use by children; proceeding as if they were on a conveyer belt: walk here, stop and look, walk here, stop and look. The comfortable, but passive, TV and movies appealed to the children even though the information presented was incomprehensible to them (just like TV and movies at home). The messages were clearly directed to adults: buy, buy every day, buy for your child, buy for yourself. (Even if you are 70, by buying our drink you can reach 100. And be famous.) There was nothing in the factory for the children to do except walk and, toward the end, drink the (little) drink. There was nothing requiring them to think, except for the unintentional local incident of the spilt tea on the bus and the three children who sang karaoke style on the return bus trip. There was nothing requiring them to make a choice. There was, except for the unplanned for time waiting for the bus and the karaoke singing which became group singing, no peer interation, another major characteristic of children this age.

Particularly troublesome is the hidden agenda conveyed directly to the mothers and indirectly to the community. By the very fact that this type of trip is arranged, it receives a status of approval. This type of trip is appropriate for 4-year-old children. It is all right for young children to be passive, to be confined for long periods of time in restrictive spaces, to have nothing to do with their hands. It is all right for adults to totally control children's bodies and minds. It is even all right when all that the adults at the factory want to do is to use children to further their own goal to stay in a profit making business. It is approved by the excellent kindergarten, the kindergarten chosen by the parents for their children, the kindergarten which is a function of an academic program in child development and education in a prestigious university. The knowledgeable director and teachers, who you respect and like so much, plan such programs for the children in their charge. They not only plan such programs, they do it for one of the special two days out of the whole year. It is not only right, it is excellent; obviously better than other kinds of activities for young children.

Loris Malaguzzi (1988), the developer and former directer of the municipal preschool program in Reggio Emilia, Italy, has asserted that too often adults treat children as if they were Christmas trees: cutting them down and removing them to a domestic, and alien, setting; decorating them so they look pretty; enjoying them for a season; and then throwing them away. Now this kindergarten and this field trip did not engage in such exploitation of children as Mallaguzzi described. No active harm and abuse were perpetrated. And yet there is a common factor. With the desire and the inten-

tion of providing for specific children, the field trip plan neglected to consider the complex and dynamic natures and developmental needs of those children. As with each blind man in investigating the elephant, the focus was on only one aspect of the child, in this case, young children's positive disposition to receive a gift, no matter what the cost. Given this focus, conclusions were reached which were devoid of all awareness of the children as thinking-feeling-acting humans of complexity, needs, and history.

Howard Lane, the professor I studied with in San Francisco, referred to such conceptions as "partsome," opposing it to "wholesome," as in "a wholesome child." Such partsome conceptions of children are common. We can find parents who see eating habits or school achievement when they view their children. We can find teachers who see group behavior or motivation for school lessons when they view their students. We can find researchers who see motor development or cognitive deficits when they view their population samples. We can find librarians who see reading activities or a lost book when they view their library patrons. Such approaches contain advantages only for the adults-the parents, teachers, researchers, librarians, and others who think in this way: it simplifies our thinking processes. The result is the conception of a child as simple, something easy to fit into our own meaning constructs, own own orientations, our own prejudices.

Sometimes in our efforts to expand our knowledge of children, we court the danger of reducing our conception of children. One example. In the U. S. it is accepted practice for university departments in social sciences to require graduate students (and sometimes undergraduate students) to engage in research. Because in the U. S., universities divide the year into either three semesters or four quarters and few students can afford indefinite stays in the status of student, if the student is to pursue independent research which goes beyond library review, there is a definite need to select a research question which can be pursued within a relatively short period of time, say a few months. So we look for something small, even if it is insignificant. Then the location needs to be accessable and convenient to the student. All of this means, of course, experimental methods, no longitudinal study, and, more often than not, a laboratory or clinical setting, preferably on campus. And the analysis will almost inevitably be statistical, especially with the statistical software programs on our computers. So typically, student research is quick, quantitative, and experimental; and sometimes what students learn falls short of what Lane referred to as wholesomeness of children.

Sometimes university professors are not as alert to the problem as they might be, thereby being able to counteract the distorted view the student is taking. With the academic culture of "publish or perish," many professors find themselves in not dissimilar circumstances, so their views can be similarly restricted. Most professors are not in the position of receiving large grants which would enable them to mount large, comprehensive, and long-term research projects. Instead they mount projects which can fit into their teaching schedules and their budgets: a small sample, a short period of time, experimentation, and statistical analysis. All too often, that's not what is really important. Every researcher worth his salt knows how to get four to six journal articles out of each research study. If two or three get published, that's an excellent percentage; it's time to move on to another subject and another little research study. And so it

goes. One's resume gets longer, and one's chances of moving up the academic ladder become greater. And sometimes what professors learn falls short of what Lane referred to as wholesomeness of children.

In his introduction to Vivian Paley's book, *Mollie Is Three*, Michael Cole (1986) addressed this matter as follows:

> During its short history in the United States, academic research on child development, like other branches of the behavioral sciences, has been preoccupied with problems of scientific methodology. If one samples any of the leading journals in the field, it soon becomes clear that quantitative methods, preferably quantification based upon experimental manipulations, are the major source of evidence about the processes that propel children's development. The virtues of such an approach are clear. Quantification and experimental control provide an objective data base which can be used to warrent causal claims about the factors that accelerate and retard development.
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> At the same time, the application of experimental techniques to the explanation of, and prediction of, human behavior also suffers from a number of acknowledged shortcommings. For purposes of the present discussion, two difficulties are most serious. First, as Walker Parcy wryly comments, " There is a secret about the scientific method which every scientist knows and takes as a matter of course, but which the layman does not know... The secret is this: Science cannot utter a single word about the individual molecule, thing, or creature in so far as it is an individual but only in so far as it is like other individuals " (*The Message in the Bottle*). Applied to psychology, the discipline which studies individual behavior and consciousness, this limitation on the scientific is particularly disheartening.
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> Second, it is an accepted truth that development is not an instantaneous process; it occurs over time, which means that time must be taken to allow the dynamics of the process to reveal themselves. Yet most experimentation (and most observations of children for that matter) involves only very brief time samples, owing to problems of cost and practicality, among others. (pp. vii-viii)

The problems are increased through the commonly held principle of originality. Replication of previous research is avoided, no matter how important the previous research might be or how great might be the need for replication. The problems with the principle of originality is keenly felt in relation to dissertations for the doctorate degree, yet there have been few breakthroughs to date. With the increasing numbers of graduate students pursuing doctural dissertation research, the range of vision gets more and more narrow. Some improvement has resulted from the increasing, although still minor, use of qualitative analysis.

American society has frequently been accused of reification of the child, that we love and respect the idea of the child but that we just don't like any real, live children. This seems to be even more clearly the case regarding adolescents. One reason for this is children's play. We just don't understand real children's play. Here are some examples of one form of children's play, play with language:

This first one is of 3-year-olds in Vivian Paley's classroom in Chicago (Paley, 1986).

"Let's play in the doll corner. Let's be kittens, okay?"

"Yeah, let's be real kittens."

"Are you a hexigon [*sic*] kitty?" Mollie asks, setting the table.

"I'm the mother."

"We're both mothers. Leslie is the baby."...

"I'll be the baby," Margaret says, curling up in the crib. "Tell me to go to bed. Are you angry?"

"Go the bed! I'm angry!" Mollie shouts.

"Then you have to go to bed too, Mommy, so I won't cry."

"Oh, oh, nighttime. Go to bed!"

"Oh, oh, morning. Wake up."

"Oh, oh, nighttime. Go to bed!"

"Oh, oh, morning. Wake up."

The girls repeat their [language repetition] game six more times before they are ready to change the plot. (pp. 35-36)

The next comes from a 4-year-old boy in New York City (Sutton-Smith, 1981).

Once upon a time there was a family of tigers, bears, and lions
and they went out for a wild animal picnic
the wild animal picnic was made of baby rabbits
that's what they ate
they took the rabbits alive and they killed the rabbits at the picnic
and when they ate the rabbits the blood washed out all the meat where
they were chewing so they missed all the parts where they were chewing
when they missed it they only got a tiny bit of tooth left
they kept chipping their teeth 'cause they forgot to take out the bones
they kept chipping their teeth so much they only had one tooth on the top and one on the bottom
then they swallowed the rabbit
after they chipped their teeth and had dinner they went home and had roasted beef rabbit
then after they swallowed the rabbit and after they had dinner they went to sleep and they all dreamt the same thing
and that's all. (*p. 110*)

Here is another child in one of Vivian Paley's classes (Paley, 1981), a 5-year-old girl.

Once upon a time there were three evil witches. They had a big pot full of witches' chicken soup. One heard a knock on the door. "What evil knock?" Then she went to the door and answered it. It was a little girl. The witch said, "You should get locked up in our take-time-out machine." Then the girl said, "I forgot. This is the wrong house." she tried to get out but they grabbed her. Then they had their soup. They laughed at the little girl. Then they heard another knock at the door. It was their grandmother with the

witches' little boy to eat the soup. "May I have some?" asked the little girl. "Yes, you may." So the witches gave her soup and let her go free. (p. 175)

This one comes from a 7-year-old boy in New York City (Sutton-Smith, 1981). It's an item on what he calls "Nixon's Favorite Menu."

Dinner

A hamburger contains of a wrench, a screwdriver, metal from a cavity and a lit lightbulb.

Bun contains of 1% starch, 99% electricity

Corned beef contains of 100% starch topped with shaving cream.

I like most restaurants. When most restaurants give you a rabbit's foot for good luck-we give you a human foot for good luck, but we mix it in with the food. (p. 214)

The last example of children's language play (I decided not to include any in this presentation that were really outrageous.) is from an 11-year-old, quite obviously from the United States (Fine & Mechling, 1991).

I pledge allegiance to the flag
Michael Jackson is a fag
Pepsi-Cola burned him up
Now he's drinking Seven-Up.

Well! It's no understatement that adults feel perplexed by children's play. Children's imaginations shift so quickly from one perspective to another, reflecting bits and patches of cultural artifacts, fantasies, and feelings. But while we cannot fully comprehend it, we know, or think we know, at least we have a strong feeling that we know, that either children are wasting their time (that is, they are not being productive from our very middle class perspective) or, and this is most troubling, we are being laughed at and everything we believe in is being laughed at. For the most part, these feelings are caused by our inability to fit children's play into any neat conceptual category. So to reduce our own discomfort, we seek to control children's play, to change it, sanitize it, domesticate it, and, most agreeably for us, stop it. It does not take much imagination on our part to hear adult voices saying to any and all of the children quoted above, things like: "Don't say things like that." "Be nice." "Don't be so silly." "Don't use words like that." "Don't you have something better to do?" "I don't know where you get ideas like that. You certainly didn't learn them from me." Riley (cited in Salamone & Salamone, 1991), in her article on the value of play in *Young Children*, the journal of the important American organization The National Association for the Education of Young Children, sums up this all too common position as follows:

> "Play," in some quarter, has become almost a dirty word. The assumption seems to be that, though play is a necessary activity of childhood that can't be eliminated entirely, it lures children off the path that leads most directly toward the kind of intellectual growth and success our society wants of its young people. (p. 137)

It is fascinating to me, but also very troubling, to note the large number of early childhood programs with which I am familiar that include the word "play" in their advertising to parents or even in their names, but, in their daily activities with children,

seek to eliminate play in favor of "learning activities" (that is, those activities directed or controlled by adults and viewed as productive of adult ends) or distort play to such an extent that it is recognizable as play only to another adult. Here are some examples.

Some years ago in Connecticut, undergraduate students in my course in advanced observation reported a learning activity for 3-year-old girls. (The boys had been directed to another room for another activity, one that involved trucks.) The teacher told the 3-year-old girls that they were going to play "tea party." Tea party, she went on to explain, involved dressing up and having tea. The children were to line up and she would dress each of them in dress-up clothes, and this they did and that she did. Then they were to sit at the tables, which they did. At this point the director entered the room and asked them if they knew what they were supposed to do at a tea party. None of them did, so she told them. Gossip. And did they know what they were supposed to gossip about? Again they expressed their ignorance on this subject. They were supposed to gossip about the boys they were going to marry.

Admittedly, this is an extreme example, even for Connecticut. But recently in Japan I attended an early childhood conference presentation of exemplary practices. Included were two videos. The first showed kindergarten children (I would guess close to 80, maybe more) in elaborate costumes in a large gymnasium performing intricate drill routines, routines modeled on those seen in the opening ceremonies of Olympic Games. This was followed by two children performing xylophones as expertly as in any Olympic synchronized swimming routine. After the video had finished, the teacher quietly but proudly stated that she had worked with these kindergarten children for 90 minutes a day for 4 months. The second video showed 191 4-year-olds engaged in extended rhythmic physical exercises.

In the Connecticut scenario we have an example of early childhood curricula which distorts play to such an extent that it has very little to do with children. Here children are used as material to achieve ends which have everything to do with the adults involved. Here the children are totally dominated and dictated to. At best, the teacher and director can be said to be misguided. Perhaps they had heard that dress-up and dramatic play were appropriate learning activities for young girls, but were ignorant of the processes which needed to be involved which make them carry learning forward. I am thinking of processes such as the children selecting the story line and the roles which can be incorporated by the story line; the children deciding whether props and costumes are needed, and, if so, selecting the various materials which can serve for props and costumes; the children assembling the props and putting on the costumes themselves, asking for help of another child when needed, and giving help when requested by another child; the children engaging in social use of language and physical action to develop a sequence of related events which follow the story line; the children judging when events are proceeding according to their own understandings of the story line and the story's roles; and the children deciding on and effecting any needed modifications or changes in direction, including the decision to stop and do something else. But what could be the reason for the teacher and the director, both veterans in teaching young children, to select such an inappropriate subject for the play

of 3-year-olds? It boggles the imagination. I suspect that this "learning activity" results from the director's and the teacher's fundamental rejection of children's play as something that they can condone in their program. At the same time, they present their center to the parents and the community as "child oriented" and "developmentally appropriate." They solve this problem by having children go through some of the motions of play, but controlling, totally controlling, everything the children do.

In the first Japanese video, where the teacher promoted performance rather than play, the children surely developed certain competencies and the enhancement of self-esteem that accompanies the acquisition of competencies. Certainly their parents were delighted with their achievement. And perhaps there was an article with an accompanying picture in the local paper, perhaps even some coverage on TV. Certainly at this early childhood conference, the teacher felt nothing but pride at a tough assignment well done. Yet I question such use of children's time.

It is not the time that was spent. There is a widely known film (Commune di Reggio Emilia, 1987) of a class of 5-year-olds in Reggio Emilia, Italy, in which the ongoing activity lasted for 4 months. This activity centered on a statue of a lion on the edge of the town's central market square. This lion was the children's old friend which they had visited often throughout their lives. The lion was imposing but small enough to climb on, powerful but a little bit old. The class made special visits to examine the lion and talk to it, think about what they knew about lions, and what they could discover about this lion. They took photographs of the lion from different vantage points at different times of the day. They devised ways to measure the lion and traced the lion's shadow as the shadow changed size and shape, devising ways to measure the various shadows. They made a mold of the lion's paw. They went back to their school and played lion-roaring, pouncing, watching, sleeping, eating, resting, stretching, running, walking. And the photographs that they had taken of the lion, they projected them on to their own bodies, so they could see themselves with the lion, the lion with them, comparing shape, comparing size. Then they worked with shadow puppets of lions, also making their own bodies part of the shadow puppet presentations. They worked with clay and many clay tools to create their lion, each one following his or her own ideas about the lion, each one developing his or her own skills with the clay and the tools. They worked with pencil and paint and colored markers, again following their own ideas, developing their own skills. They talked together about the lion that they knew so well, as well as the real lions in the real world and the fantasy lions in their imaginations. They searched for information about lions in books and also in comic books. One of their teachers made a lion head and paws of foam rubber (some of the children helped him make it) and gave it to the children so they could once again play lion. The continued to develop their ideas and feelings about the lion through clay and paint and pencil. And all of these activities about the lion were among the many other activities in the young children's lives, such as eating and napping, having birthdays and making friends, going to grandmother's farm and watching the cows get milked. The film was made of the activities by one of the teachers, nothing professional yet rich in life and learning. Four months. Long, flowing periods of time can give children opportunities to develop their ideas and skills, to develop them-

selves. Long, endless periods of repetition, of following the dictates of an adult, can reduce and distort children's feeling about their own worth and purpose.

The second Japanese video, the 191 4-year-olds all doing the same physical activity—it reminds me of the fad in the U. S. during the 50's of seeing how many people can get in a phone booth at the same time. The major difference is the matter of choice: in the phone booth situations, although surely social pressures were involved, the adults probably had some degree of choice in deciding to engage in the play; in the case of the 191 4-year-olds, they did not. In times of national military buildup, such behavior by adults has a purpose. But 4-year-olds in present day Japan? I wonder about the concerns and fantasies of the adults involved.

Let us look once again at developmental and learning activities in which young children are engaged, activities which seek to address the wholeness of children's beings. The first involves a 5-year-old in his home in France (Williams & Kamii, 1986).

> A mother asked her 5-year-old to put out the napkins for the main meal every day. There are four people in the family, and Jean-Pierre could count to about 30. On the first day, he took out only one napkin to put on a plate. He then returned to the cupboard for a second napkin, and so on, making four trips. At 5 years, 3 months, and 16 days, he suddenly thought to count the plates, then counted four napkins, and distributed them on the table. He proceded in this way for 6 days.
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> On the 7th day, there was a guest and one more plate. Jean-Pierre took four napkins out as usual, distributed them, and noticed that one plate remained empty. Instead of getting an additional napkin, he collected the four already on the plates and put them back in the cupboard. He then began all over again and made five trips.
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> The next day, the guest was not there, but Jean-Pierre made four trips, and continued the same method for 5 more days, until he again thought to use counting. After 10 days of counting, Jean-Pierre was told that there was to be a guest again. He distributed his four napkins as usual, but this time went to get the missing napkin when he saw the empty plate. The next day, when there were only four people again, he counted the number of plates before fetching the same number of napkins. The arrival of a guest never disturbed his napkin distribution system again. (p. 25)

Here we see a number of striking features. Jean-Pierre's mother gave him a task to do, that is, she was able to share her responsibilities with her young son and then determined a task which she believed he could accomplish. The task chosen was one that was important to and would directly benefit all members of his family. By carrying out this task, Jean-Pierre would not only increase his skill but also his value to his entire family, the outcome of his task being clearly observable at and contributing to the family's daily communal ritual. Once his mother gave him the task, she let him pursue that task on his own terms and in his own ways, resisting all impulses to rescue him from inefficiencies and time consuming approaches. Therefore, he was put into a position in which he had to judge the adequacy of his work, and, when he deter-

mined inadequacies, he had to invent methods of action which would, again according to his judgment, remove the inadequacy and provide a situation which would meet the requirements of his given task. Surely, by so doing, he increased his conception of himself as a person capable of pursuing a task of importance and changing requirements, a person of competence who can accomplish a task through his own thinking and actions, a person who can directly contribute to the well-being of his family and their circle of friends and associates.

How fortunate he was to be free of well-meaning adults and older children who wanted to help him, for inevitably such help results in stopping his thinking, forcing upon him a pattern of action which conflicts with his understanding. Howard Lane would refer to such help as cutting off the tadpole's tail. While the tadpole might look more like an adult frog, this tadpole will still be a tadpole, but now one without a tail. And you don't get a frog sooner by cutting off the tadpole's tail. Many teachers, especially, force feed children, on the premise that children will, armed with new and better armor, be able to think and act more maturely. By being free of such artificial manipulation, Jean-Pierre was able to develop his own thinking processes. The consequence was that he did learn more mature thinking strategies and, most importantly, he understood why his later thinking strategies were preferable to his earlier ones. Using a phrase from the Nobel Prize winner Szent-Györgyi (1964), he "lived his learning" (p. 1278). And surely his disposition was strengthened toward further challenges and further learning.

The next example of developmental and learning activities in which young children are engaged is a classroom situation in Connecticut in the 1970's (Self, 1978/1979). The children, children ages 4 through 7, had been on a field trip to a small peanut factory where peanuts were roasted and bagged. The children were unable to participate in the activities of the factory, but they were able to closely observe the large bags of raw peanuts being opened, portions of the raw peanuts put into a closed container where they were roasted, roasted peanuts put onto racks to cool, and then the cool roasted peanuts put into small bags which were then sealed and boxed for shipping to stores. They were given bags of both raw and roasted peanuts to take back to school. The following took place in their classroom after the trip. In addition to the teacher and the children, there were some parents who had gone with them to the factory.

Teacher: What do you like to eat that is made of peanuts?
Children: Peanut butter!
Teacher: Would you like to make peanut butter?
Children: Yes!
Teacher: What do we have that we could use to make peanuts into peanut butter? (One child goes quickly to the cabinet and pulls out the meat grinder.)
Child 1: The meat grinder.
Teacher: What makes you think that the meat grinder will change peanuts into peanut butter?

Child 1: Well, when we ground the cranberries with it, it came out all mashy. (This is a reference to an activity during the previous November.)

Child 2: And the potatoes. They came out brown just like peanut butter. (This is a reference to preparing potato latkes [pancakes] during the previous December.....

Teacher: What else can we use to make peanut butter?

Child 3: Step on them.

Teacher: How?

Child 3: Just put 'em on the floor and step on 'em. That'll make peanut butter for sure.

Teacher: Would you leave the shells on or take them off?

Child 3: Uh, take 'em off or leave 'em on. Either way it'll make peanut butter.

Child 4: I know a way. You can put them in the blender.

Teacher: Would you check to see if we have a blender here now. I don't remember.

(A check was made; no blender was found.)

Teacher: We have something else much like a blender, but with larger blades.

Child 5: A food processor.

Teacher: Yes. We can see what that will do with peanuts. Any other ideas? What else do we have; what other ways can you think of to make peanuts into peanut butter?

Child 6: How about a peanut butter maker?

Teacher: Good idea. We don't have one.

Child 6: Oh.

Child 7: Hey, I know. We can use the hammer and hammer them.

Teacher: Would you take the shells off first?

Child 7: Yup.

Teacher: What about the skins?

Child 7: Yup.

Teacher: I see. Are you sure you would want to take the shells off first?

Child 7: Yeah. I would.

Teacher: How would you take them off?

Child 7: Like this. (The child puts a peanut between his teeth and cracks it open).

Teacher: Who would eat the peanut butter you would make?

Child 7: I would

Child 8: I wouldn't

Teacher: [Speaking to Child 7.] Why do you think Kanalpa wouldn't want to eat your peanut butter?

Child 7: Don't know.

Teacher: Kanalpa, can you tell Louis why you wouldn't want to eat...

Child 8 : 'Cause it's been in your mouth.
Teacher : Is there some other way you can break the shell and not smash it all into peanut butter?
Child 7 : Easy, man. Easy.
Teacher : Show me with your hand how you would hammer it just to break the shell.
(Louis goes through an elaborate slow motion demonstration.)
Teacher : Now, how will you hammer it to make peanut butter?
(Louis immediately bangs his hand down hard on his knee causing some pain, which he tries to conceal.)
Teacher : I see. (Referring to his hurt.) Fortunately we have a cutting board to make the peanut butter on. You can use it as a hammering board. [To all the children.] Any other suggestions for ways to make peanut butter?
Child 9 : Smash them.
Teacher : What?
Child 9 : Smash them.
Teacher : Yes, smashing peanuts will make peanut butter.
Child 10 : I know a good way. Use your teeth.
Teacher : That's an excellent way to make peanut butter for yourself. It make the perfect size: bite size. But what about sharing the peanut butter with your friends?
Child 10 : No.
Teacher : No. That's not a very good idea. But for peanut butter for one, it's ideal.
Child 11 : How about punch them?
Teacher : Try it. See if it works.
Child 12 : I know another way. You could smash them under a chair leg. You could put a peanut on the floor and put the chair leg on it and then sit on it.
Teacher : On the floor?
Child 12 : Yeah.
Teacher : Wouldn't the peanut butter get terribly dirty?
Child 12 : Well, we could put the chair on the table.
Teacher : And sit on it on the table?
Child 12 : Yeah.
Teacher : What about all the dirt on the bottom of the chair leg?
Child 12 : Well, we could use soap and water and wash it.
Child 5 : I know. Get a new chair.
Teacher : Buy a new chair just to make peanut butter?
Child 13 : If you got a plastic bag, you could put your peanuts in it. Then the peanut butter would be clean.
Teacher : My! That's a fine idea. Anything else? Can you think of any other ways that peanuts could be made into peanut butter?

Child 14: We could boil them first.

Teacher: That's true. We could boil them first. Now, let's get busy making peanut butter. Let's experiment with each of the methods. Would you adults help us out? If each of you worked with a different small group of children on one activity, it would be great. Now, let's see what we are going to do. I'll write the different ways to make peanut butter on the board. Then we can decide who is doing what.

The session continued. Everyone was involved in at least one method. Someone remembered the book press and that was tried, also. The chair on the table was the most spectacular, the boiled peanuts the most unexpected. The hammer method was quite a disappointment. Everyone was surprised at how many different ways there are to make peanut mash, inadequate as peanut butter, but still good to eat. The meat grinder with the small blade made quite crunchy, but good, peanut butter. The food processor produced what the children said was really peanut butter. (pp. 170-174)

Some weeks later the class was visited by a representative of a nutrition education program connected with the State Land Grant College. One of the parts of the nutrition education program involved showing children how peanut butter could be made by crushing peanuts with a baby food jar wrapped in tape. The visitor was amazed at what the class had done, and saw no reason to go to such trouble when it was easy to crush them with a baby food jar. Karl, 6 years old, spoke up: "Yeah, but if you only know one way and you can't do it that way, then you need to know another way to do it." (p.175)

Clearly, this teacher is not interested in demonstrating one method by which the children are to accomplish the assigned task. Following the learning principle of many materials/one action, one material/many actions, the teacher is interested in stimulating children to investigate a variety of methods to act on one material. The teacher encourages the children to think of many ways in which they can accomplish the desired physical change in a familiar and positively regarded material. And for the most part, the teacher is receptive to their ideas. Also, this is not a contest in which the "best" idea, as decided by the teacher, wins. All of the ideas are tried out, and they are tried out by the children, not by the teacher. The children are active in providing ideas. They listen to each other, and sometimes they get a related but different idea from an idea expressed by another child. The children are active in putting their ideas into practice. They get the materials that they need and decide on how they will use the materials. The children are active in judging the outcomes of their actions. They decide what is acceptable and what is not, what is peanut mash and what is really peanut butter.

This is a school experience which is rich in learning. One reason the learning is so rich is that the classroom is rich in material resources. Nicholson, the American landscape designer who was a leader in participatory involvement of users in the design process, wrote in his essay "How Not to Teach Children: The Theory of Loose Parts":

The simple facts are these:

1. There is no evidence, except in specific cases of mental disability, that some young babies are born creative and inventive, and others not.

2. There is evidence that all children love to interact with variables, such as materials and shapes, smells and other physical phenomena, such as electricity, magnetism and gravity; media such as gases and fluids; sounds, music and motion; chemical interactions, cooking and fire; and other people, and animals, plants, words, concepts and ideas. With all these things all children love to play, experiment, discover and invent and have fun. All these things have one thing in common, which is variables or "loose parts." The theory of loose parts says, quite simply, the following:

*In any environment, both the degree of inventiveness and creativity, and the possibility of discovery, are directly proportional to the number and kind of variables in it.* (p. 30)

In all too many classrooms there is a paucity of things, a paucity of a variety of things. A classroom composed of multiple tables, chairs, desks, books, and bulletin boards can hardly compare with what this classroom must have contained, if we can assume that its meat grinder, food processor, hammer, cutting board, plastic bag, cooking device which could boil peanuts, and book press are examples of its array rather than the total of its contents.

We see Nicholson's theory in operation when children delight in the wrapping, the ribbon, and the box while the present they contained, with more significance for the giver than interest for the child receiver, receives little attention. We see it in such active settings as adventure playgrounds (but, infortunately, rarely in settings with that name in the United States; to see any great number, one has to go to Great Britain, Scandinavia, and other areas in Europe and get there before these are closed by narrow thinking public authorities). We see it in static settings where young people who, desperate to make some impact on their world, commit what is termed by others "vandalism," although they may see it as "making something happen."

In this "peanut butter" classroom there are many ideas which come from the teacher and also-and especially-from the children. In addition, there are many loose parts, many things with which the children can try out, extend, and develop their ideas. John and Eizabeth Newson (1979), the English developmental psychologists, have observed that children must manupulate things with their hands before they are able to manipulate ideas in their minds. Constance Kamii (Williams & Kamii, 1986), who has insightfully applied Piaget's theories to classroom practice, clarifies this point as follows:

> When we talk about the child's action, we rarely use the term manipulation. The reason is that manipulation refers only to the external act, which can be mindless. Piaget's term action refers to mental action, which is often accompanied by physical action in early childhood.
>
> When we gently squeeze a plum or a peach to find out how ripe it is, we do so because we want to know something about the fruit. The important part of our action is the mental part, without which the external act would be

mindless manipulation. (p. 25)

> Young children physically act on the objects as they put them into relationships. As they grow older, they become able to group, order, or divide them in their heads without touching the objects at all. In short, the manipulation of objects is desirable in the logico-mathematical realm because young children think better when they physically act on the objects. (p. 25)

However, objects have value in the young child's environment which goes beyond physical or logico-mathematical thinking. (Logico-mathematical thinking, by the way, concerns the mental process of making a relationship between one object and another.) Objects also provide children with the opportunity to develop skills, skills in the use of objects both as materials and as tools. Diversity of objects provides children with greater opportunity to make connections between their children's environment and their home and community environment, and, based on these cultural connections, to extend their social connections through language and action with their teachers and the other children. And when children are able to combine one object with another, one loose part with another loose part, they can increase the complexity of their activity and their thinking.

I would like to conclude by returning to the previous topic of research in the field of psychology. Roger Barker, in his *Ecological Psychology* (1968), discusses the emphasis in psychological research on behavioral measurements.

> But there is an incompatibility here: to achieve stable behavior measurements, stable conditions must be imposed upon the person, and the same conditions must be reimposed each time the measurement is repeated. This method provides measures of individual constancies (under the designated conditions), but it eliminates individual variations (under different conditions), and it destroys the naturally occurring contexts of behavior.
>
> The problem is not peculiar to psychology. The strength of a beam can be measured only under specific conditions, and under the same conditions each time the measurement is made. But a beam has many strengths depending especially upon its structural context. The same is true, too, of the meaning of words. Words have a range of meanings, the precise one being determined by the context in which it occurs. A good dictionary gives a number of these meanings, the model meanings; but for greatest precision it uses the word in revealing contexts. A person is like a beam or a word: he has many strengths, many intelligencies, many social maturities, many speeds, many degrees of liberality and conservativeness, and many moralities. (pp. 5-6)

I want to pursue this idea of the multiplicities of a person, relating it directly to the multiplicities of a child, but first I want to share with you a passage from *The Way of the Carpenter* (1990) by William Coaldrake, the first non-Japanese member of the Kyoto Dentoo Kenchiku Gijutsu Kyookai (Kyoto Guild of Traditional Master Builders):

> The carpenter believed that the spirit of the tree had to be accommodated in its new location at the building site, but he had to know the environment in which it grew to maturity for practical reasons as well. In this context the

> old adage that the carpenter "does not buy a piece of wood but buys the mountain" (ki o kawazu yama o kau) is very true. The original orientation of the timber to the north or south had to be respected. This was not only to placate its spirit but also to ensure the suitability of a timber to its new location in a building; south-side wood is better adapted to warmth and should once more face south, whereas north-side wood is better able to withstand cold temperatures as it confronts the penetrating winds of winter. (pp. 25-26)

To take us back to children, here is a passage from Betty Smith's *A Tree Grows in Brooklyn* (1968):

> And the child, Francie Nolan was all the Rommely's and all the Nolans. She had the violent weaknesses and passion for beauty of the shanty Nolans. She was a mosaic of her grandmother Rommely's mysticism, her tale-telling, her great belief in everything and her compassion for the weak ones. She had a lot of her grandfather Rommely's cruel will. She had some of her Aunt Evy's talent for mimicking, some of Ruthie Nolan's possessiveness. She had her Aunt Sissy's love for life and her love for children. She had all of Katie's soft ways and only half of the invisible steel of Katie.
>
> ... She was made up of more, too. She was the books she read in the library. She was of the flower in the brown bowl. Part of her life was made from the tree growing rankly in the yard. She was the bitter quarrels she had with her brother whom she loved dearly. She was Katie's secret, despairing weeping. She was the shame of her father staggering home drunk.
>
> She was all of these things and of something more that did not come from the Rommelys nor the Nolans, the reading, the observing, the living, from day to day. It was ... the something different from anyone else in the two families ... the one different thing such as that which makes no two fingerprints on the face of the earth alike.

We recognize ourselves in these passages, not, perhaps, in the details, but in the realization of our own complexities, our multiplicities, our quidities. We recognize these in ourselves, and we must strive to realize that these are also commonalities and that these commonalities can be recognized in our own children and in the children with whom we do our work. It is easier to recognize these in our own children; we are able to observe our own children in many different situations over long periods of their lives. It is harder to recognize these in the children with whom we do our work, because we are not able to observe these children in many different situations over long periods of their lives. And since we relate to them in one aspect of their lives and usually in one environment of their lives, we focus on what we know best and on where we put our efforts, stressing the commonalities and tending to forget that there are other parts of the children's worlds, parts that we may know nothing about. But knowing this, being conscious of the limitations of our perspectives and our information, we can do two things. First, we can deliberately act in ways which do not reduce the complexities, multiplicities, and quidities of children, their "many strengths, many intelligencies, many social maturities, many speeds, many degress of liberality and conservativeness, and many moralities." Second, we can deliberately act in ways which

encourage and support the curiosity, the wonder, the quidities, the multiplicities, the wholesomeness of children. The extended activities in Reggio Emilia on the lion are, I think, an excellent example, as are the activities in France of placing napkins on the family dining table and the activities in Connecticut of making peanut butter. All of them provide for children to be who they are and engage in processes which help them become who they want to be, and at all times remaining whole and developing whole.

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