COMMENTARY

SOME COMMENTS ON CONTEXT EMBODIMENT IN ZOOTHERAPY: THE CASE OF THE AUTIDOLFIJN PROJECT

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ABSTRACT

The Autidolfijn project was undertaken in 1991 in Bruges, Belgium, to asses the effect of interactions with captive dolphins on learning in autistic children. The project lasted four years and ended with ambiguous results. Although one group of children did seem to gain learning benefits from working with the dolphins, difficulties arising from the experimental set-up itself seemed to play a role in how well the groups performed. The Autidolfijn project was intended as an experiment, but it was imperfectly controlled and consequently the data could not be used to answer directly the question of the therapeutic effect dolphins have on children with autism. Here the data generated from the project are presented as ethnographic data attached to a particular situation. It is hoped they will help researchers understand the difficulties involved in trying to assess experimentally the positive effects of animals on people (cf. Rowan, 1996; Marino and Lilienfeld 1998; Nathanson 1998).

INTRODUCTION

In one of his editorials, Rowan (1996) mentioned the difficult relationship that exists between researchers and practitioners in the field of zootherapy. While most practitioners are convinced that animal-assisted therapy programs are useful, and show positive results, "very few of the scientific studies of animal-assisted therapy have found any positive impact" (Rowan 1996: 2). Thus, it seems there is a paradox: practitioners do succeed–or believe they do succeed–where researchers do not. Either practitioners are victims of illusions–they see more than what really happens–or researchers are blind to essential things which escape their scientific methods. The disadvantage of highlighting the problem this way is that it seeks the guiltyy, and this keeps both sides mutually suspicious.

It is, however, worth noting that this either/or way of elucidating the problem relies on some implicit assumptions: it is assumed that the animal has a positive effect, and that this effect can be objectified. It is also assumed that the animal's effect exists *per se*, independent of any other variable–the animal is responsible for any positive effect.

The story of the Autidolfijn project presented below pleads for another kind of explanation. Namely that the experimental context itself (with its need for control, repetition, standardization and measure, and neutrality) might be responsible for the "disappearance" of any animal effect. This kind of explanation is rooted in an anthropological point of view, which considers any human-animal interaction setting as a place where meaning is to be socially constructed. "Once in contact with humans, [animals] are given a cultural identity as people try to make sense of them, understand them, use them, or communicate with them. They are brought into civilization and transformed accordingly as their meaning is socially constructed" (Arluke and Sanders 1996:9).

We know that psychotherapy is not a question of mechanical causation, but a question of communication and meaning: "Only through communication might psychotherapy be achieved" (Bateson and Ruesch 1988: 234). So when dealing with the therapeutic effect of animals on people, we should be ready to look at how the animal is constructed as a social

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partner by the patients and the therapist, and also of course at how the presence of an animal in a therapeutic session or program affects the meaning that the patient and the therapist ascribe to the therapeutic setting.

What the story of the Autidolfijn project suggests is that the social construction of meanings might be achieved very differently in practice than in research. When talking about the "social" construction of meaning we do not intend to describe "society," but rather the "context embodiment" of a zootherapy program. We use the concept of context as it was defined simply by Birdwhistell as "a here and now ethnographically verified. It is not an environment, it is not a milieu, it is a place of activity in a time of activity" (in Winkin 1981: 293).

Consequently, our aim is to describe context embodiment in a particular zootherapy program, the Autidolfijn project, and to suggest how a rigorous experimental context might prevent the animal's presence from effecting any positive change.

Between research and practice

The Autidolfijn project was a four-year research study which aimed to assess the effect dolphins have on learning in children with autism. The original hypothesis was "Do dolphins foster learning in autistic children by increasing their attention capacity and their motivation to learn?" However, problems with controls and the research requirement to standardize format prevented us from answering the question as stated. However, while it was not possible to use data from the project to draw general conclusions about the therapeutic effect of dolphins on children with autism, it was possible for it to be used as observational data attached to a particular situation which could be ethnographically described.

The description of the Autidolfijn project which follows is made up of three different parts. The first is intended to describe the Autidolfijn project as a whole, while the second part presents selected observations as well as the methodological tools used to collect them. The third part describes the particular interactional patterns in which those data appeared, i.e., the contexts of the sessions. It is hoped that this information will show how practitioners might create a context propitious to change, and how experimenters might create a context propitious to stability. This could be the reason why practitioners and experimenters often achieve different results.

THE AUTIDOLFIJN PROJECT AS A WHOLE

How it began

In 1992, after a television report on the therapeutic effects of dolphins on autistic children, parents of children with autism repeatedly requested the Belgian dolphinarium of Bruges to allow their children to come and swim with the dolphins. The authorities of the dolphinarium did not know how to answer these requests, and they eventually asked the Laboratory of Anthropology of Communication, University of Liège, to help them establish a dolphin-assisted program for autistic children. A collaboration was formed between the dolphinarium, the educational establishment Ter Dreve, where children with autism receive special education, and the laboratory.

What is autism?

Autism is a "pervasive developmental disorder," associated with cerebral disfunctioning. Autism can be associated with normal intelligence or various levels of mental retardation. It is diagnosed from three groups of symptoms (below), each of them ranging from light to severe forms (from Peeters 1988).

i) Abnormal language development. Children with autism have difficulty understanding that a word stands for something. Words which stand for abstract things, or words which can have several meanings, like pronouns, are most difficult for them.

ii) Abnormal social development. Children with autism may not be able to understand non-verbal expressions of anger or affection, and may be unable to express them themselves. To them, mimics and postures are generally too variable, and the social relationships too complex and unpredictable, to be handled. The social isolation in autism does *not* result from a lack of social interest (as was once thought), but from helplessness.

iii) Resistance to change. Children with autism have a need for sameness and can be very disturbed by minute changes. This is directly related to the difficulty in understanding the world around them, and in classifying events according to "main" and "detail" categories. As a consequence, routines come frequently in place of understanding. The making of a structured environment is considered crucially important for them; "the unique means by which we can allow them to orient themselves in the chaos of the outside world." (Peeters 1988: 28)

At Ter Dreve, the educational approach for children with autism is directly inspired by the TEACCH method (Schopler and Mesibov 1984). Education and learning are considered the main therapeutic tools. For if children with autism are disadvantaged by deep misunderstandings, then teaching can help them to come to share more and more assumptions with us; this in turn will have a positive effect on their social and emotional development.

The Autidolfijn hypothesis

The research team drew on the complementary work of David Nathanson and Betsy Smith to delineate a working hypothesis.

Through working with children with mental disabilities, Nathanson (1989a, 1992) demonstrated that in-water interactions with dolphins increased learning: "dolphins, used as part of both stimulus and reinforcement, were two to ten times more effective at increasing attention and language skills for children with mental disabilities than were stimuli and reinforcement used in land-based classroom procedures" (1992:17). Nathanson's 1992 study better controlled the water environment and allowed him to conclude that "water work with dolphins evoked a greater number of and higher level responses than without dolphins" (1992:17). To explain the observed "dolphins' effect" on cognitive learning, Nathanson used the "attention deficit hypothesis," stating that in children with mental disabilities, learning is impaired by an attention deficit rather than by information processing deficits (Nathanson 1989a). In this context, dolphins are supposed to "hold a special fascination for children" (Nathanson 1989b: 11), and therefore increase their attention span. Nathanson did try to work with children with autism, but he gave up after a while, because "[children with autism] are usually not sufficiently attentive to dolphins to measurably improve [their] functioning" (1992: 26).

On the other hand, working from a totally different conceptual framework than Nathanson, Betsy Smith was very optimistic about the possible benefits that children with autism could gain from interactions with dolphins (1984). From the data generated by Project Inreach, a pioneering pilot study which began in 1978, Smith saw "the feasibility of using the Atlantic bottlenose dolphin as a facilitator in eliciting communicative responses from autistic persons" (1984: 154). One of her most important findings was "the consistent increase of sustained attention span during and after each dolphin-child encounter" in every child (1983: 465). One eighteen-year old, Michael, reacted so positively to the dolphins that Smith decided to offer him the opportunity to meet dolphins again. This resulted in the Dolphins Plus project, a case-study of Michael's encounters with dolphins (Smith 1984). Her conclusions supported the hypothesis that the Atlantic bottlenose dolphin could stimulate spontaneous social behavior in an autistic person. She provisionally explained it in reference to play therapy, and grounded her explanation in "the basic principles of general systems theory" (1984: 160).

Teachers at Ter Dreve had reported that teaching was difficult because of autistic children's lack of motivation and their constant attention shifting. From the work of Smith (1984), it was expected that there would be an increase in the attention span of children with autism in dolphin encounters. From the work of Nathanson (1992), dolphins were expected to act as sources of motivation and reinforcement. Our hypothesis was formulated as: "Interactions with dolphins foster learning in autistic children, by increasing their attention faculty and their motivation."

Description of our quasi-experimental design

The Autidolfijn project was made up of two successive experiments. The first (dolphin group 1, classroom group 1 and computer group) began in 1992 and lasted 16 months. The second (dolphin group 2 and classroom group 2) began in 1994 and lasted 14 months. Because of the special difficulties autistic children have dealing with a new environment, our team chose a control group design, with habituation sessions intended to help the children become used to the experimental situations. Table 1 (pg. 8) gives a summary of the experimental design.

Both experiments followed the same protocol. A three-child "dolphin group" had the opportunity to interact with the dolphins, under the supervision of a dolphin trainer, and a particular cognitive task was then taught to them. Three other children were taught the same cognitive problem in a classroom, under the supervision of a specialized teacher. In the first experiment, a third group of three children was also involved. They were required to work on a similar task using a computer in a classroom, under the supervision of a psychologist from Ter Dreve. All teachers were previously given training sessions to establish the use of the same training methods. Children were matched as well as possible (but not perfectly) according to

Table 1.

The Experimental Design of Autidolfijn

Shows the number of habituation sessions, pre-tests, learning sessions and post-tests for each group of children.

	Habituation Sessions	Pre-Test	Learning Sessions	Post-Test
dolphin group 1 (D1)	20	4	10-13	4
classroom group 1 (C1)	0	4	15	4
computer group (CP1)	20-35	4	0-15	4
dolphin group 2 (D2)	10	2	10	2
classroom group 2 (C2)	0	2	10	2

their age and their developmental level, measured by the PEP (Psychoeducational Profile), which measures the development of imitation, cognitive performance, verbal expression, fine and global motricity, perception and hand-eye coordination in autistic children from one to twelve years of age. The cognitive task in the first experiment was a two-criteria (colour and shape) classification; the task in the second experiment involved a match to sample test (ordered stripes of colour).

The end of the habituation sessions was decided according to two criteria. Children were considered as ready for the learning task when:
i) their level of stereotyped behaviors (which is an expression of their global arousal level) was brought back to normal (as evaluated by the psychologist from Ter Dreve);
ii) they mastered some prerequisite behaviors. In the dolphin groups children needed to be able to take an object brought by the dolphins and put it in a basket; in the computer group they needed to be able to move the cursor at will on the screen, using the appropriate keyboard keys.

At the end of the habituation period, two or four pre-tests (depending on the experimental material) were administered to all the children. They were then given 10 to 15 learning sessions, at the end of which two or four post-tests evaluated their progress in learning.

Description of the Sessions

All sessions were held on an individual basis and lasted 15 to 20 minutes, the maximum period considered as reasonable for focused activities for a child with autism.

Habituation sessions were intended to make the children interested in the dolphins and the computer and to have them mastering the prerequisite behaviors. These sessions were slightly different in the dolphin and computer groups. In dolphin groups, children were gradually put in contact with the animals: approaching them from the platform, touching them, tossing balls and rings, and giving fish. After some attempts proved unfruitful, children did not enter the water. In the computer group, children were gradually introduced to the computer through play software. In both computer and dolphin groups, periods of "free play" alternated with periods of more explicit learning, devoted to the establishment of the prerequisite behaviors. Children in classroom groups had no habituation sessions. It was thought that there was neither prerequisite behavior nor a new situation to be habituated to in the classroom setting, since this was their normal situation.

In the **learning sessions,** leisure times alternated with working times. In dolphin groups, dolphins brought the children foam rubber pieces which later had to be correctly placed on a board. The children routinely took two to four pieces from the dolphins, then went to the board, where they were instructed on how to correctly place them. Then they went back to the dolphins and gave them fish. Other foam pieces were thrown into the water, and the whole sequence was repeated. In classroom groups, children took the pieces from a basket and were instructed on how to correctly place them on a board. They were given "social reinforcement" ("good," clapping hands) after each correct response, and after a while they were allowed to rest on a sofa. The teaching material was the same in the dolphin and the classroom groups. In the computer group, play bouts alternated with learning bouts.

Selected Observations and Evaluation Procedures

Data collected during Autidolfijn included results on the post-tests and measures of the children's attention span using videotape analysis. All sessions in every group of children were videotaped. Out of the 10-15 learning sessions for

each child (a total of 183 sessions lasting 15 to 20 minutes), we selected five sessions per child for analysis (sessions 1,3,5,7,10 or 1,4,8,12,15, depending on the number of learning sessions the children received). To draw comparisons between groups, we first distinguished between two situations: 1) work, i.e., explicit learning settings, when the child faced the board, or worked at the computer; 2) leisure, i.e., interacting with the dolphins, facing the dolphin tank, or playing at the computer. The resting times in the classroom groups were not recorded as play and so were not included in the data set.

"Attention" is a widely-used concept, although it remains quite obscure. For the present study, it was defined as "behaviors focused on the activity" (for example, to look at the board or at the computer, to take a foam rubber piece, to place it on the board, to move the cursor while looking at the computer screen, to look at the dolphins while giving them fish). The duration of all bouts of behaviors focused on the activity were recorded. In a second viewing, the behaviors of the children towards the dolphins were recorded. These behaviors were classified as "spontaneous" (appearing without prompting by the dolphin trainer), or "prompted" (appearing after the dolphin trainer indicated to the child that he needed to do something, and what). Bouts in which the dolphin trainer requested the child to do something but was not obeyed after three seconds, were also noted.[1]

Results of the learning task

Results for each child are given in Table 2 (pre-test and post-test) on page 10. For the first experiment, the results were striking: all the children in the dolphin group (D1) learned the task perfectly, and with fewer sessions than children in the classroom group (C1). When post-tested later at Ter Dreve with another material (paper), children of D1 were even able to partially transfer their newly acquired skills to a new context, something which is reputedly difficult for autistic children to do. In the classroom (C1), only Sofie showed learning above the chance level (1/15).[2] In the computer group (CP1), children were unable to learn how to handle the cursor (only one of them did succeed), and the learning of the specific task could not take place. In the second experiment the results were much less clear: in both dolphin and classroom groups, two children were above the chance level (3,3/10), but none of the children seemed to have learned the task as well as children of the first dolphin group. Two children who participated in both experiments (Sofie and Daniel) had better post-test results when learning took place at the dolphinarium than when learning occurred in the classroom.

Comparing the results at the post-test with the developmental level of each child (Figure 1), we see that children in C1 had exceptionally bad results, given their developmental level.

Measures of the children's "attention"

Figures 2.1–2.5 show the mean activity duration and the percentage of time each child was focused on the activity (attention score) at play or learning (work). Children in the computer group had the highest attention scores at work and at play (Figure 2.5). However, they could not learn to move the cursor or learn the task. In D1, the three children all had very similar patterns: they all spent more time at the tankside than at the board, and all had higher attention scores when learning at the board than when interacting with the dolphins (Figure 2.1). In D2 (Figure 2.2), Sofie also has higher attention scores when working than when interacting with the dolphins, but Daniel and Nele showed as much or more focus on dolphins than on the task. When in the classroom (Experiment 1), Sofie achieved higher attention scores than when working at the dolphinarium (Experiment 2) (60% *vs.* 45%, Figures 2.2 & 2.3).

Figure 3 shows the mean total amount of time children were recorded focused on the task per session. Over a whole session, children of C1 were focused on the activity at least as long as D1 children, and for 2 minutes more for two of them. This was due to the high proportion of time devoted to the learning task in C1 and, to a lesser extent, C2. But this measure is strongly discordant with results at the post-test: given their total attention time, children of C1 should have learned better.

[1] The possible bias of these evaluation procedures is that the video analyses were performed by only one judge: the author.

[2] Chance level is defined as the probability of giving a correct answer by chance only. In the first experiment, children had to choose between 16 positions (four shapes and four coulours), only one of them was the correct answer. Thus, the probability of giving a correct answer by chance was 1/16 for one trial. As the post-test was made up of 15 trials, the chance level for the post-test results was a score of 1/15. In the second experiment, children had the choice between three positions. The chance level for the post-test (10 trials) result was a score of 3.3/10.

Table 2.

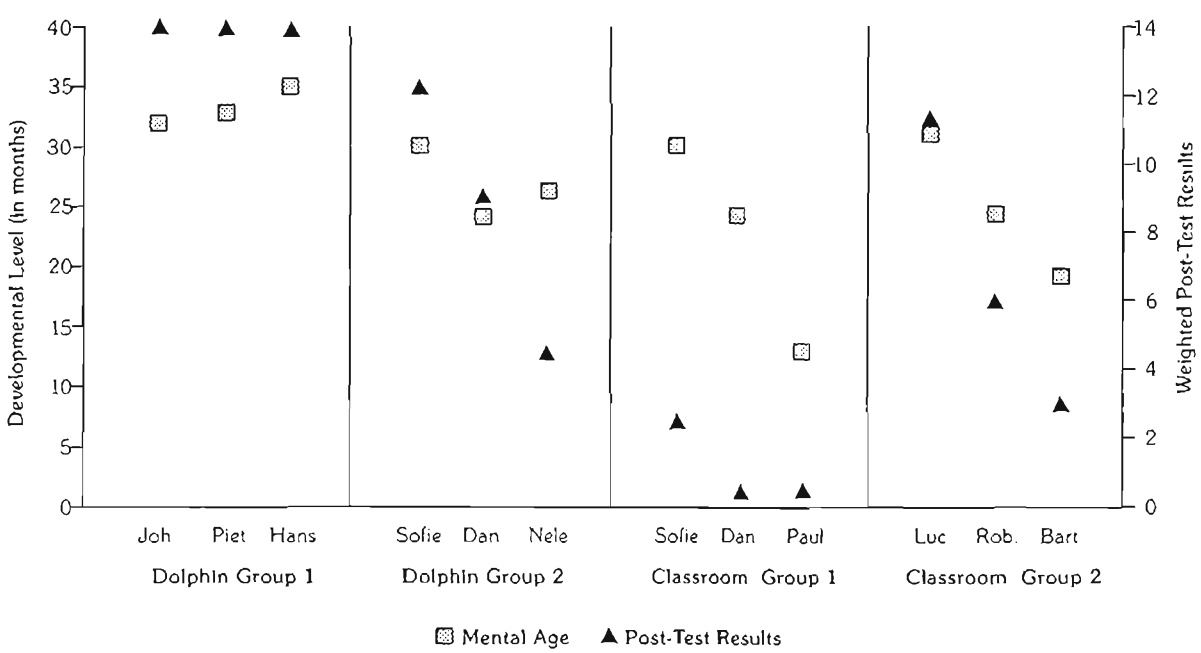
Pre-test and Post-test Scores for Each Child in Each Group for the Two Experiments

	PRE-TEST						POST-TEST			
	EM	EM	CM	CM	n	Max.	EM	EM	CM	CM
EXPT. 1										
D1										
Johan	0	/	0	0	10	15	14	14	12	11
Piet	1	1	0	0	13	15	14	14	6	13
Hans	2	1	0	0	10	15	14	14	13	14
C1										
Sofie	3	1	0	0	15	15	2	3	0	0
Daniel	2	0	0	0	15	15	0	1	0	0
Paul	2	1	0	0	15	15	0	1	0	0
CP1										
Mark	/	/	0	0	15	15	/	/	0	0
EXPT. 2										
D2										
Sofie	2	2	1	0	10	10	9	8	/	/
Daniel	2	3	1	2	10	10	6	6	/	/
Nele	2	2	0	0	10	10	2	4	/	/
C2										
Luc	2	4	4	/	10	10	5	10	/	/
Robert	3	1	1	/	10	10	6	3	/	/
Bart	3	2	4	/	10	10	1	3	/	/

D1 = dolphin group 1; C1 = classroom group 1; CP1 = computer group; D2 = dolphin group 2; C2 = classroom group 2; EM = Experimental material - foam rubber colored shapes or stripes, and the blackboard (for the dolphin and classroom groups), and the computer software (computer group). CM = Control material - made of paper. n = number of learning sessions. Max. = maximum score.

Figure 1.

The Developmental Levels (left axis, in months) and Weighted Post-test Results (right axis) for Each Child



Figures 2.1–2.5.

Mean Time Devoted to the Activity and Mean Percentage of Focused Behaviors for Each Child in Each Group

On the left: learning, on the right: interacting with the dolphins at the tankside (dolphin groups) or play at the computer. As there is no play activity in classroom groups, results appear only for the learning task.

Figure 2.1

Dolphin Group 1

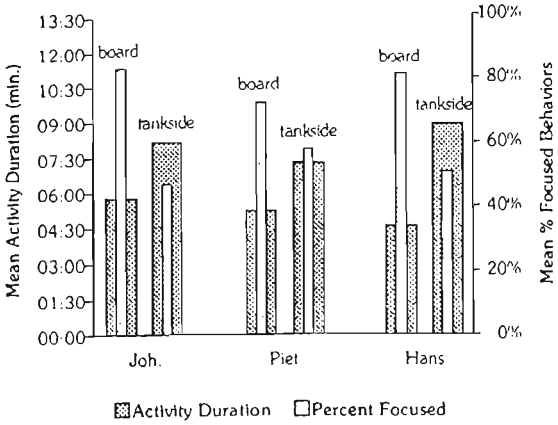


Figure 2.2

Dolphin Group 2

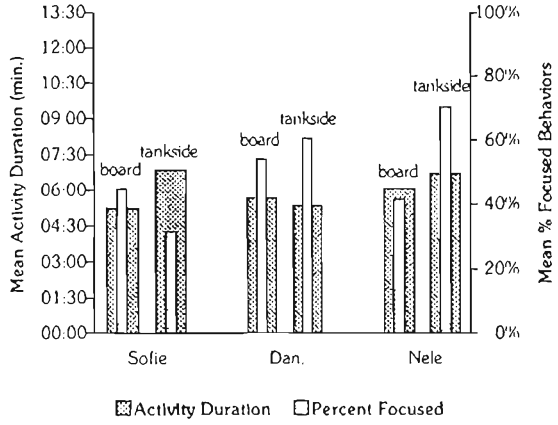


Figure 2.3

Classroom Group 1

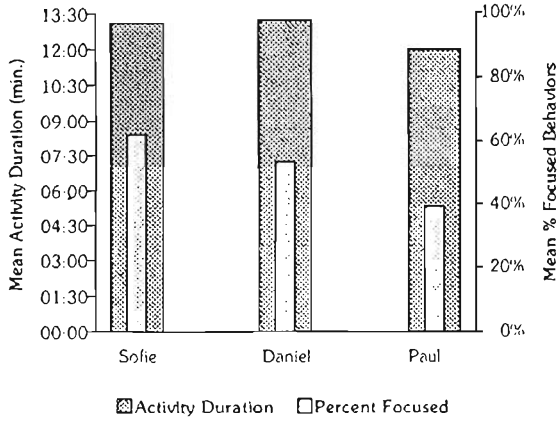


Figure 2.4

Classroom Group 2

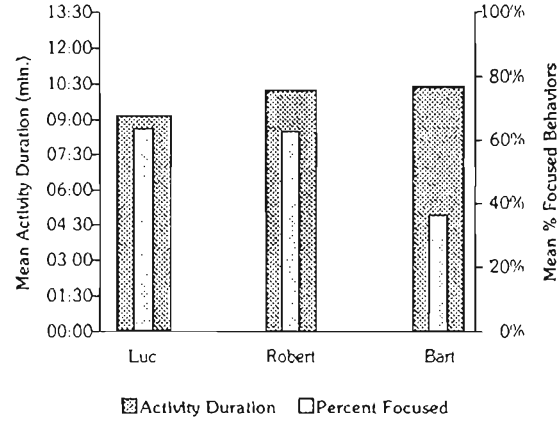
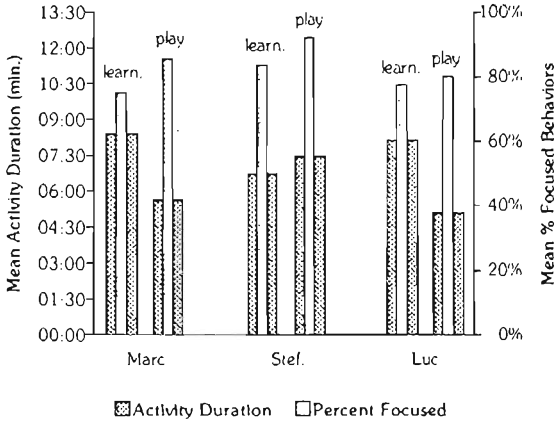


Figure 2.5

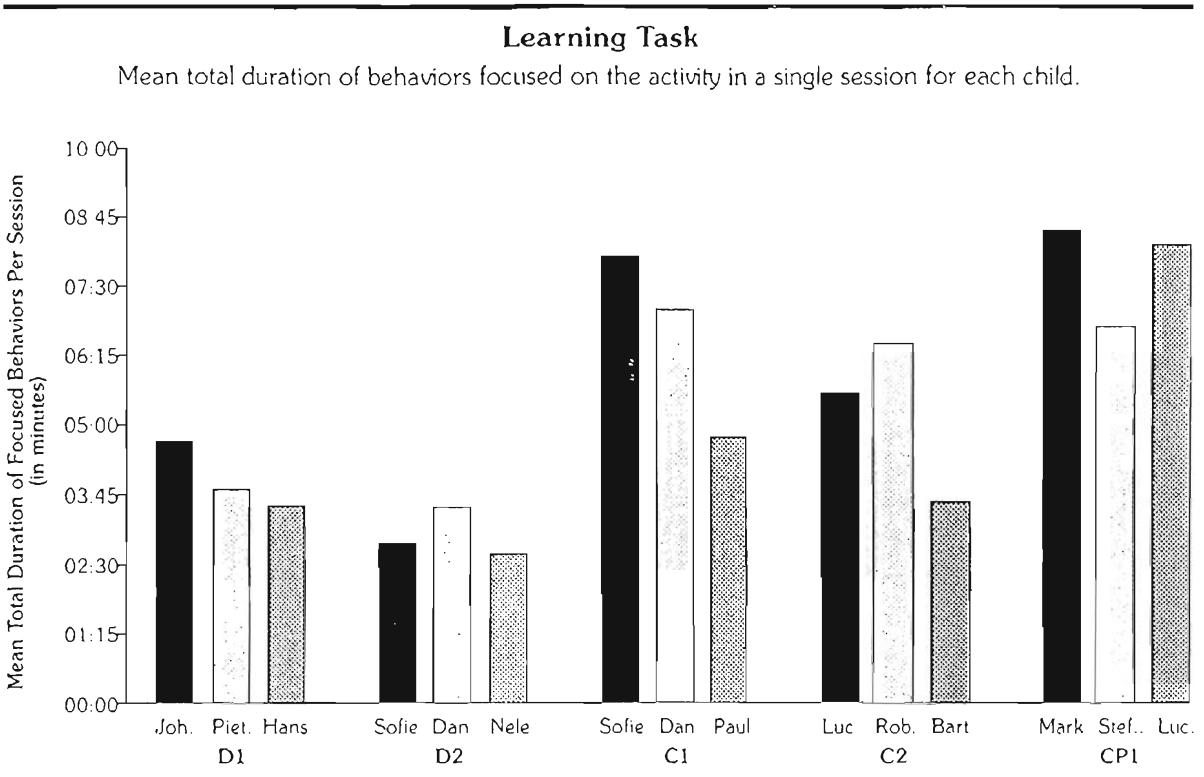
Computer Group



HOW THE CONTEXT EMBODIMENT OF AN EXPERIMENT MIGHT AFFECT RESULTS

In order to suggest how a relational network might be created in Autidolfijn we must look at the interactional patterns, i.e., the very concrete behaviors of people and animals (Wittezaele and Garcia 1992). A complete ethnographic description of Autidolfijn is given in Servais (1996). Here we'll limit our description to the typical, and contrasted, context embodiment in three groups of children: C1, D1 and D2. These three groups embody sufficiently well contrasted gestalts whose descriptions provide metaphors for our practice/research problem.

Figure 3.



A Circular Interactional Pattern Preventing Learning

The poor correlation between intelligence levels and post-test results in C1 (Figure 1) was mentioned earlier. So, when trying to explain why Sofie and Daniel, who participated in both experiments, learned much better at the dolphinarium, we would be less interested in the better results achieved when working with the dolphins than in the children's exceptionally poor results (given their developmental level) in the classroom. To understand this, we must admit that "something" prevented them from learning.

From an ethnographic point of view, we would relate the poor results of C1 children to the development of a competitive relationship between the classroom and the dolphinarium teachers. This is the context in which learning occurred. In the classroom, Tania (the teacher) really wanted to do the best with her children, maybe she wanted to do "as well as the dolphins." But what her children learned was to "do anything, then wait for the teacher to show the right answer." This was quite clear in the videotapes : the children put the foam rubber piece anywhere on the board, then waited. Facing this apparently disorganized behavior, Tania reacted by explaining again and again. While explaining, she was giving the right answer. Then a new sequence would begin.

Of course, the more children of D1 advanced, the harder Tania tried with her group. She was really alone, as nobody could understand what was happening with her children; they progressively lost any interest in the learning task, and she became depressed but kept trying. The children also responded to Tania's pressure by exhibiting focused attention behaviors which were not valid cues for their real participation in the session (cf. Figure 3, which shows that the attention measures are strongly discordant with post tests results for C1 in Table 2). They exhibited the external signs of paying attention (looking in the direction of the board, taking foam rubber pieces from the basket), but were not participating in the learning task in the way which was required for making progress. The development of this mutual adaptation between Tania and the children may have been boosted by positive feed-back loops. The children adapted to Tania's pressure by exhibiting behaviors (false attention cues) which in turn increased the pressure, because Tania could not understand what was happening.

Tania's commitment to the experiment (and to the results) through her intense relationship with the children is of course typical of *practice*. Such a circular interactional pattern should not develop in a strict research design, because of the demands for standardization

and neutrality. From the poor results of C1 children it is clear that the therapist's commitment to an experiment (in this case to a control group) can greatly affect the results.

Repetition, Neutrality and Social Link

Contrasted with the exceptionally bad results of C1 is the exceptional learning of children in D1. All of them perfectly mastered the task. In addition, they constantly progressed towards our requirements, while in other groups attention measures did not increase regularly. Children of D1, but not of D2, had similar attention patterns (Figures 2.1 & 2.2). They also exhibited behaviors focused on the activity which were valid cues for their real participation in the sessions (Figure 3). Finally, children of D1 had not only learned how to master the problem, they had achieved a kind of super-learning, indicated by their ability to partially transfer their newly acquired skills to another context (Table 2). In fact, children of D1 probably learned a lot more than just how to solve a cognitive problem. All this is unusual for children with autism. In addition, the emotional tone of the sessions was relaxed and optimistic, even when we faced unforeseen behavioral problems (e.g., one of the children was ready to jump into deep water).

Although designed to be identical to the first group (the same organization of the sessions, the same criteria for habituation, the same locations at the tankside, the same teacher), D2 was different in every way: children were difficult to handle, unpredictable, reluctant to work. An indication of the deeply different interactional patterns that were created in the two groups is shown by the fact that, in order to handle the children's behavior and have them do what they were supposed to do, it was never necessary to coerce any of the children in D1 but it was in D2. In D2 it was necessary to hold children, hold their head directed towards the board, and sometimes to hold the child by the shoulders or the hips. If this wasn't done, D2 children would quit and walk in all directions. This started almost from the beginning of the habituation sessions and had to be maintained throughout the habituation and learning sessions. On the whole, D2 children did not participate in the sessions in the ways that D1 children did; they needed constant coaching. Also, while children of D1 all had similar attention patterns, that was not the case in D2 (Figures 2.1 & 2.2).

This kind of difference between two groups of children, D1 and D2, who were submitted to generally the same learning procedures, is neither a question of mere intelligence level, nor of quantity of habituation sessions. As it was shown in Table 1, children in D1 received 20 habituation sessions, while children in D2 only had 10. But the interactional pattern we see in D2 was present almost from the beginning of the habituation sessions and lasted throughout the learning sessions. It is likely that more habituation sessions would only have reinforced the existing pattern. It is to be concluded then that if children in D1 and D2 ended up meeting the same criteria at the end of the habituation sessions, they proceeded along very different paths.

One plausible explanation for the difference between D1 and D2 is precisely the difference between participation and neutrality. At the very beginning of the project, the organization of the sessions was not definite, especially in the dolphin group. The teachers went along with the children and adapted themselves to their reactions in an evolving process. This allowed for the development of a session design well adapted to the children, because it was co-created with them. In doing this, the experimenters established with the children a real *social link*, as defined by Gregory Bateson in Naven (1958): the response of an individual to the behavior of another individual towards him. We considered the children's behaviors as responses to our own behavior towards them. During the habituation sessions, several changes were made (for example, after some attempts it was decided not to go in the water anymore) until we arrived at a kind of equilibrium point, which became the typical organization of the sessions. It is likely that the whole process was crucial for the establishment of shared assumptions between the children and their teachers. These assumptions are very basic and have to do with the social definition of the situation : "we are here to learn (teach) something," "the dolphins are a reward for a good work..." Such assumptions must be shared if we want children to progress in their learning. The creation of a true social link between experimenter and subjects is again typical of practice rather than research. In the case of D1, it was crucial for the learning process.

On the contrary, D2 children began with the established design from D1, in order to repeat the experiment. However, the children were not the same and they hadn't the opportunity to be our partners in the creation of a reality (the design of the sessions) we arbitrarily imposed on them. If children were real participants in D1, they were only experimental subjects in D2. The global regulation of the children's behavior was very different from D1: we

tried to have them conform to rules *already set*, and the main part of our efforts was directed at correcting them towards our goal–instead of looking at them and considering their behavior as reactions to our actions. Here, repetition and standardization themselves prevented the children from being full participants in the construction of a shared social reality around the animals. It is also worth noting that the kind of experimenter-subject relationship that we can observe in D2 meets the criteria for the experimenter's neutrality.[3]

This kind of neutrality appears to have prevented the children in D2 from learning the task as well as children in D1, because they failed to learn the working rules of the sessions. For example, Nele (D2) didn't share with her teacher the simple assumption "this is a learning session;" she never understood or accepted that dolphins were supposed to be a reward, and she kept trying to escape the learning setting to approach the dolphins; something she did with great joy. Quantitatively, Nele and, to a lesser extent, Daniel, were more interested in the dolphins than in the learning (Figure 2.2). From these clinical and quantitative data we would conclude that in the case of Nele and of Daniel, interacting with the dolphins was not embedded in the learning routines. Here the dolphins instigated a strong social response, an important result in its own right (at least clinically), but it did not allow us to "test learning," which was the research focus.

CONCLUSIONS

The interactional patterns–or gestalts–we have described for three groups of children differed greatly. In classroom group 1, the relationship between the teacher and the children was described as being driven by positive feedback loops, a very powerful factor of change in any information processing system – and interaction is such a system. In dolphin group 1, a true social link between the experimenter and the subjects was observed. A true social link allows (but not necessarily causes) mutual adaptation and changes in an interactional system. Because of that social link, the therapy sessions were part of an evolving process in which children participated. In dolphin group 2, the interactional patterns observed were shaped by negative feedback loops : our actions were aimed at reducing the difference between a predefined norm and the children's actual behaviors. In C1 and in D1 there was an interactional dynamic, triggered by the way information was processed in the system. The therapist-subject interactions had the potential for change, and this was objectified by the results at the post-test (very poor in C1, very good in D1). For children in D2, negative feedback loops and neutrality favored stability instead of change: this interactional system was not an evolving process.

From a research perspective, C1 and D1 are badly controlled groups (therapist commitment vs. neutrality, sessions badly standardized, non reproducible results). However, they are good models for practice. On the other hand, D2 is a good model for research (well standardized sessions, neutrality, reproducibility). Therefore in the field of zootherapy we need to choose between badly (or imperfectly) controlled practices, where change can appear, and true experimental contexts which favor stability. Consequently, the animal *per se* cannot be considered as responsible for the changes observed (Nele's interest in the dolphins didn't make her learn better). What is responsible for the changes observed is the animal *plus* the context in which the patient-animal interactions take place. From Autidolfijn it appears that when therapist and patient are not allowed to build their own reality around the animals, the animal's potential for change is accordingly diminished. More rigorous and standardized experimental designs may make the "animal's effect" disappear.

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[3] In communication terms, neutrality can be defined as not considering, for example, the yelping of a dog as a call for help. In this situation, the dog's signal does not provoke any reaction on the part of the experimenter. Typically, the experimenter does not consider the dog's message as a response to his/her behavior towards the dog

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