A theoretical perspective to examine AAT/RAA: Group dynamics

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Abstract - The present study introduced group dynamics as a promising theoretical perspective into the area of Robot Assisted Activity (RAA). Group dynamics examines the whole nature of the group, namely collectivity (e.g., the norm, tacit premises, and atmosphere of the group). We examined the cases of Animal Assisted Therapy (AAT) for elderly people, and found that the group concerned generated new collective behaviors and communication as a result of AAT. If RAA is closely related to the collectivity of a group, RAA can also be examined from the perspective of group dynamics. We examined a case of RAA, and found that new collective behaviors and communication were generated during RAA. We could conclude that we were able to examine AAT and RAA from the same viewpoint, group dynamics.

Key Words: group dynamics, Animal Assisted Therapy, Robot Assisted Activity, collectivity

1. Introduction

In the present study, a new theoretical perspective is proposed for AAT and RAA from the viewpoint of group dynamics. Especially, we regard AAT and RAA as the changing process of collectivity owing to introduction of the heterogeneity, and try to link researches of AAT with RAA studies from the same viewpoint, group dynamics.

Recently, the use of animals to help generate a will to live during medical treatment has become popular in Japan. The use of animals, i.e, Animal Assisted Therapy (AAT), has been adopted as one of the medical practices for various patients. The programs and goals of AAT are designed by medical staff (e.g., doctor, social worker, occupational therapist, physical therapist). The relationship between humans and animals is recognized as being a part of the care process. Treatment using animals has been applied to patients in varying situations, including psychiatric patients, elderly people, children and veterans.

Besides, quite recently, the new care activities utilizing not living animals but pet-type robots are being conducted in Japan. These types of care activities are called "Robot Assisted Activity", namely, RAA. RAA follows the way of the care activities utilizing animals, and has been applied to various clients.

Few previous studies in this field have focused on group dynamical aspects of AAT (and RAA). Most of the studies are not group-oriented, but individual-centered. That reflects an overall reductionist strategy, with the tendency to explain phenomena in terms of concepts and language at an individual level, especially in terms of characteristics and/or behaviors of individual clients. The effects of AAT are categorized into three types: the physiological, psychological and sociological effects [1]. First, the physiological effects showed that the existence of animals improved the clients' physical conditions. For example, patients' blood pressure stabilized as results of interacting with animals [2] and the patients of cardiovascular disease who owned pets survived longer than non-pet owners [3]. Second, the psychological effects showed that AAT or pets improve the clients' mental states.

Without a doubt, the clients who participated in therapy with animals showed a longer attention span than those who didn't participate in that therapy [4]. The presence of the animals was one of the factors that relieved the clients' depression after stressful experiences [5] and additionally animals improved the motivation of clients to partake in the group activities [6]. Third, sociological effects indicated that interaction with animals enhanced the clients' social interaction [7]. As Corson and Corson report, when the animals were used as a remedy, the interactions between the patients and the medical staff were likely to be facilitated [8]. Social interaction between clients and other members are thus facilitated due to the animal acting as a social facilitator.

The series of research above, however, adopted a schema that the diseases (e.g., high blood pressure, depression) were within the patient's own body and that the client recovered from those diseases through AAT. This framework agreed with the view of modern medicine and psychotherapy. Studies showing the effects of AAT from the viewpoint of sociology and QOL [9] may seem to expand their viewpoints from individuals to groups. However, they restored the effects of AAT to the patient's own body.

AAT (and RAA) is never realized by a client alone, but is performed by a group of participants, including clients, therapists, animals (or robots), and even family members of clients. We should examine dynamical changes of the group as a whole, instead of just paying attention to the change of an individual client. Furthermore, the effects of AAT (and RAA) are neither limited within physiological nor psychological phenomona, but usually extended to interpersonal and sociological arena. Those are the reasons why we examine AAT (and RAA) from the viewpoint of group dynamics in the present study.

In this paper, 1) we give an outline of our theoretical perspective, group dynamics and theory of collectivity, and 2) we introduce a study of AAT from the viewpoint of group dynamics. Then, 3) we introduce a case of RAA and try to link RAA research with the researches of AAT, and 4) we propose plans for further research and practice of RAA.

2. Theoretical perspective: Group dynamics

In the theory of group dynamics, the researcher examines the whole nature of the group. We define collectivity briefly as the whole nature of the group. The life-world that emerges in front of an individual is not the inner-world within the body of the individual but the nature of the world that appears with "Look" in front of the individual. Sugiman conceptualizes the two sides of collectivity: Collective behaviors and communication [10].

A collective behavior is defined as an observable behavior shown by a collectivity as a whole. If you notice some nature in a collectivity, something like a group, an organization, a crowd, a community, or a society beyond mere plurality, it is because the collectivity shows some collective behaviors. Importantly, collective behavior cannot be observed when we see that behavior only through one individual. For example, in animal assisted therapy, we can't observe such a collective behavior as therapy if we only watch either the behavior of the therapist or the conduct of the client. When we seize both of them as a whole, we can observe therapy as a collective behavior.

The collective behavior appears in both the physical environment and objectified environment. The former is referred to as the physical environment. For example, chair, desk, door, wall and all physical environments surround our daily life. While the objectified environment is constructed when collective behavior is patterned and the pattern is realized as an object (e.g., laws, rules and institutions).

When people conduct a collective behavior, they abandon the opportunity for simultaneous alternative collective behavior in an unrelated environment. A group therefore generates a particular collective behavior and abandons another collective behavior simultaneously.

Any collective behavior is regarded as a communication process. In the present study, communication is not regarded as a transfer of information from one person to another; here communication is defined as a process of creating, developing, maintaining, or erasing the norm that is the basis of cognition and behavior for the people who belong to the collectivity. The norm is the operation that indicates the correct cognition and behavior. For example, under our everyday norm, it is correct behavior that the patients should receive the doctor's advice under medical treatment.

One crucial point is that the stability of the norm has great influence on communication. The norm prescribes even our primitive cognition and behavior. For example, distinction between object and living thing in our cognition is provided by norm. If the stability of norm weakens, even distinction between living things and object make obscured.

If we define the norm as expressed through language, then the unexpressed operation is defined as Look (in Japanese, Hyoujou) [11], for example, the atmosphere in the field. We can't illustrate the serious atmosphere during an examination or a peaceful ambience when we are playing with dogs through language. However, when Look appears in front of us, we intuitively recognize and understand it.

A group generates a particular norm and Look by conducting a collective behavior as communication. At the same time, the opportunity of generating another norm or Look is abandoned into an unrelated environment. For example, when we play with a "dog", the cognition that what we are confronting now is a "dictionary" is usually abandoned, and ignored directly.

As above, when we investigate a group as a whole, the whole nature of the group, the collectivity, consists of two sides: Collective behavior, and communication. The tacit premises or the

implicit rules that form our daily lives are defined by the collectivity. At the same time, we generate the collectivity constantly through a collective behavior as communication. The collectivity appears in front of the members of the collectivity as Look and is recognized directly by those members.

The crucial point is that the heterogeneity can transfigure the existing collectivity dynamically [12]. Heterogeneity means the other novel collectivity differs from the existing collectivity. For the group members, collectivity defines the tacit premises of their daily life. The tacit premises of the group themselves cannot be pointed out by the members specifically. However, when the heterogeneity emerges in front of the existing collectivity, the previous rules are renewed, and new collective behaviors and communication are generated actively.

Let us now turn our eyes onto the research of AAT and RAA. Not only AAT, but also RAA can be regarded as the changing process of collectivity owing to introduction of the heterogeneity. After the next chapter, we examine the cases of AAT and RAA from the viewpoint of group dynamics.

3. AAT from the perspective of group dynamics

We examined two cases of AAT with dogs (dog therapy) for elderly dementia inpatients from the perspective of group dynamics [13, 14]. We investigated dog therapy as the changing process of collectivity owing to introduction of heterogeneity. Here, we explain the case of dog therapy in a geriatric hospital in detail [13].

Method

We examined the dog therapy for elderly inpatients with dementia conducted in geriatric hospital A (Sanda, Hyogo). This program was conducted by the Japan Rescue Association (JRA: Non profit organization: Toyonaka, Osaka) using two therapy dogs they had bred. JRA has one of the strictest training programs for dog therapy in Japan. Staff members of JRA were well acquainted with the knowledge of psychological and physical aspect of the target, and their therapy dogs were well-trained for the dog therapy program.

In each session of dog therapy, about 10 inpatients with dementia and 4 staff of JRA with 2 therapy dogs joined. Duration of the dog therapy program was about 1 hour per session. The clients were selected from elderly inpatients who had diagnosis of dementia and were not fearful of dogs in the hospital. The clients were randomly classified into with-dog groups and without-dog groups. The patients of the with-dog group participated in dog therapy while regular rehabilitation programs were administered to the without-dog group. In the without-dog group, rehabilitation staff supported the clients.

We carried out three kinds of participant observations. 1) We observed weekly dog therapy programs and regular rehabilitation programs. Participant observations were conducted once a week from April 1998 to February 1999. 2) To examine the daily life of the

patients and staff at hospital A, we stayed at the hospital over night and observed on three separate occasions. 3) One of the authors worked in regular service for a short term at hospital A for eight days. In those observations, we wrote memorandum and described fieldnotes [15]. In addition to those observations, we conducted a series of open-ended interviews with 11 individuals involved with the dog therapy program.

We collected both quantitative and qualitative data to measure the effects of dog therapy on the clients. For quantitative data, we selected three items (No. 2, 7, 9) for remembering from the revised version of Hasegawa's dementia scale (HDS-R) [16]. We submitted the data to a 2 (between subjects-use of dogs[D]) × 8 (within subjects-Times of therapy[T]) ANOVA. With regard to qualitative data, we used three types of observation records. 1) the fieldnotes previously described, 2) the observation sheets the staff of hospital A completed and 3) the open-ended observation record written by JRA staff. We summarized these observational data and described an ethnography of the therapy.

Discussion

When we take the patients as a whole group, the most significant change observed in the patients in dog therapy at hospital A was the transfiguration of the whole members' Look [11]. The change was so remarkable that the persons concerned with AAT commented frequently, "When the clients interacted with the dogs, they presented very different Look!". Mainly, they noted the clients' facial expression, such as smiles. The transfiguration of Look contained not merely facial expressions such as smiles, but also various collective behaviors (e.g., smiling at the dogs, reaching out their hands to the dogs). This alteration of the patients' Look was so significant that a nurse commented, "They look so good that we may be able to talk to them". Additionally, the results of ANOVA revealed that there was a significant difference at D \times T interaction (F (7,105) = 5.273, p<.01). This meant that with-dog group could get higher score of HDS-R than without-dog group as a result of dog therapy program.

Moreover, various changes were seen not solely in the clients but also in the personnel of the hospital and the staff members of volunteer organization and other individuals concerned with dog therapy.

As for the personnel of hospital A, the collective behaviors and communication were changed as a result of dog therapy. Two of the most significant changes were observed: Removal of the clients' diapers and introducing the dogs to the regular rehabilitation programs. The group of personnel in hospital A were conducting their daily works (collective behaviors) and generated many tacit premises such as the disease of senile dementia, the patients of the senile dementia and the staff members of hospital A. These tacit premises influenced the personnel's collective behaviors and communication. As a result, the patients' Look appeared in front of the personnel only as the patients suffering from senile dementia. Therefore, the personnel recognized the

patients' Look, such as "they can't talk with us because of senile dementia". However, such preconceived tacit premises concerning the patients and the inability of the staffs to communicate with or easily handle clients were suspended by the transfiguration of the clients' Look during dog therapy. After introducing dog therapy, the staff members constructed the new implicit assumptions (e.g., we can remove the clients' diapers, it is a good idea that we introduce the dogs into the wards). Those new collective behaviors and communication were generated by the change of the patients' Look.

On the other hand, the staff members of JRA generated various collective behaviors and communication such as holding the training meeting and listening more to the needs from the participants of dog therapy. As we mentioned above, the staff members of JRA had sufficient skills for conducting the dog therapy program. However, by conducting dog therapy many times and acknowledging the patients' Look directly, the staff members renewed and developed their implicit assumptions. Therefore, they adopted various activities for elaborating and developing dog therapy programs more. Those new collective behaviors and communication were closely related with the other two groups' collectivity.

We could conclude that the dog therapy at hospital A was the transfiguring processes of the collectivity owing to the introduction of heterogeneity. The dogs were unfamiliar existences for the collectivity of hospital A and had an impact on the clients' Look. Significantly dog therapy influenced the tacit premises of the whole members of hospital A, namely collectivity. The transfiguration of the patients' Look made the people concerned question their tacit premises. As a result, new collective behaviors and communication were generated, namely, the collectivity in hospital A had changed.

We examined other case of dog therapy at geriatric health service facility (facility C, Kobe, Hyogo, Japan) conducted by JRA [14]. We conducted participant observations once a week at the facility from September 1999 to August 2000, and could reconfirm the findings we examined above. The most significant change was also the transformation of the clients' Look. The relationship between clients and staff members was also changed by transformations of the clients' Look. Before the dog therapy it was difficult for the personnel of facility C to communicate with the clients joined in dog therapy program. After the dog therapy, however, the personnel tried to talk with them, and were willing to take care of these clients. These cases suggested that the tacit premises of the staff members at facility C were transformed, and that new collective behavior and communication were generated after the introduction of the dog therapy. We could reconfirm that the dog therapy at facility C was the changing process of collectivity by introduction of heterogeneity.

Additionally, in the second study, we could examine why the collectivity was transfigured as a result of AAT. Namely, we

investigated what heterogeneity emerged in front of the existing collectivity in the care facility. We adopted the theory of hospitality [17], and examined why the collectivity was transfigured by AAT. Hospitality is defined as the relationship between care-giver and sufferer in which the former stands by the latter merely because of the existence of the latter. This means that when a care-giver is hospitable to the existence of the sufferer, a relationship between the care-giver and the sufferer is generated in which the sufferer is central. Namely, this relationship originates with hospitality in the care. It was suggested that hospitality of dogs provoked the reversal of the relationship between care-giver (i.e., dogs) and sufferer (i.e., clients). Therefore, the collectivity was transfigured as a result of dog therapy program. In the second study, we found that the heterogeneity (i.e., dogs) had a role of hospitality in care facilities for the elderly patients.

4. RAA from the perspective of group dynamics

In our previous studies about AAT, we could conclude that AAT is the transfiguration process of collectivity. Especially, the introduction of heterogeneity (i.e., animals in the situation of care) caused new collective behaviors and communication in the existing collectivity (e.g., hospital A, facility C).

Then, can we examine RAA from the same theoretical perspective of AAT research? Can robots bring about new collective behavior and communication?

Next, we explain a case of RAA for elderly dementia inpatients [18]. In this case, we investigated 1) whether RAA had impact to change the collectivity or not, and 2) what type of communication was generated during RAA session.

Method

The place conducted RAA was geriatric hospital A (Sanda, Hyogo). 1) We observed RAA with AIBO (an autonomic pet-type toy robot produced by the SONY corporation) directly for three days, and recorded them by observation notes and VTR from March to May 2001. 2) We attended staff meetings three times and interviewed with twelve personnel. Based on these qualitative data, we examined the responses of patients and the personnel toward pet type robot during their interaction with it.

In this hospital, the personnel introduced two AIBOs to the daily recreation program of this hospital. In the RAA session, three groups joined in. The staff members guided this activity. They taught the meaning of behaviors of AIBO to the patients, and tried to liven up that session. About ten elderly inpatients joined in the RAA session to play with AIBO. These patients with dementia were invited by personnel, therefore, they could participate in RAA freely, and could leave without restraint. And, we, the researchers joined in RAA as observer. Duration of RAA was about fifteen minutes per session.

Discussion

Although we observed RAA only three times, we could find that various new collective behaviors and communication were generated during the RAA session. Additionally, during RAA session, we and the personnel could observe six specific responses of the patients, namely from Response-1 to Response-6. Comparing with the clients' dementia level, we made qualitative categories based on the patients' responses, and patients' dementia level reported by personnel of hospital A (Table 1).

Table 1. Six specific responses of the patients during RAA

	Patients' specific responses	Patients' dementia
		level
Response-1	Playing with joy	"slight"
Response-2	Positive ignorance	
Response-3	Fondness for AIBO	"middle"
Response-4	Fear toward AIBO	
Response-5	Stare without showing emotions toward AIBO	"heavy"
Response-6	No response toward all subjects	neavy

We could categorize the clients' six specific responses into three types of communication. Namely, "Communication through AIBO", "Communication with AIBO", and "Communication with no one". As we mentioned in Chapter 2, the term, "communication", means a process of creating, developing, maintaining, or erasing the norm

The first type of communication, namely "Communication through AIBO", corresponds to the patients showed Response-1 and Response-2. The patients who showed Response-1 enjoyed playing with AIBO. They enjoyed conversation with other patients and staff members through AIBO. These patients who were categorized in Response-2 took a look at that activity, however, they were not interested in that activities. They left RAA voluntarily, and attended other recreation programs. Although Response-1 contrasted to Response-2, a point in common was that they treated AIBO just as an elaborate toy. That is to say, they regarded AIBO just as an object. Whether the patients enjoyed RAA or not, they made communication with staff personnel, not with AIBO. These responses indicated that the norm covered with them was sufficiently strong similar to staff personnel.

Second, the case of Response-3 and Response-4 were corresponded to "Communication with AIBO". As for the clients showed Response-3, they were absorbed in playing with AIBO. Just like some elderly patients with dementia showed strong attachment to dolls as if it were their own baby, they are affectionate to AIBO. It means that the patients with Response-3 regarded AIBO as un-demarcated objects that are body-like (i.e., a living thing). The other

side, the patients with Response-4 feared AIBO seriously, and refused to interact with AIBO strongly. Those patients mentioned AIBO as uncanny thing. It means that the patients with Response-4 regarded AIBO as un-demarcated bodies that are object-like. Whether they attached or feared, those parents interacted with AIBO as if AIBO were living thing.

Although Response-3 was contrast to Response-4, a point in common is that the distinction between living thing and object was obscure for them. This means that their behaviors toward AIBO were the sign that the norm covered with these clients was weakened, therefore, the distinction between body and object was obscure. Therefore, these patients made communication seriously with AIBO.

Third, the patients with Response-5 and Response-6 showed very few responses not only toward AIBO, but also toward personnel and other objects. The patients showed Response 5 stared with AIBO. But they showed no emotions toward AIBO. And, some patients showed Response-6 had no responses not only toward AIBO, but also all other subjects and materials. It indicates that the norm covered with them was weakened to the extent that these patients could hardly make communication with anything.

In short, the six types of behaviors observed in the RAA session correspond to the level of norm (i.e., one side of communication in the theory of collectivity) covered with those patients. Namely, "Communication through AIBO" corresponds to stable norm. "Communication with AIBO" comports with the unstable norm, and "Communication with no one" corresponds to the feeble norm.

We could conclude that this case of RAA was also closely related to the collectivity. We found that the responses toward AIBO meant the level of stability of the norm covered with the patients and the personnel. That is to say, the interaction during RAA was prescribed by the collectivity. As similar to AAT, RAA is the changing process of collectivity by introduction of heterogeneity (i.e., robots). We could examine RAA from the viewpoint of group dynamics.

5. For further researches and practices

As we discussed above, we could examine the cases of AAT and RAA from the same viewpoint, group dynamics. We could conclude that not only AAT but also RAA was changing the process of collectivity by introduction of heterogeneity.

Here, we propose plan for further researches and practices of RAA.

5.1. For further practice of RAA

We examine two issues for further practice of RAA: "How to use pet type robot" and "importance of Guide of RAA". As we examined in last chapter, we found that the responses toward AIBO correspond to the level of norm. Therefore, as practical implications, we may use pet-type robots as "a measuring instrument of the norm". That is to say, we can use this robot as an index of the level of norm. If we can use pet-type robot including AIBO as a measuring instrument, we may try to make valid communication with these dementia patients. Namely, care-givers can conduct better care by using pet-type robots as measuring.

Additionally, we have to pay attention to the importance of the role of "Guide" who conducts RAA. Surely, development of high quality robot is an important issue. However, the role of "Guide" is more essential during RAA session. In RAA, "Guide" has a role not only to operate robot, but also to make communication with the participants. Whether RAA is conducted as care activity or as recreation, the participants generate collective behavior and communication. "Guide" plays important role to make sense RAA with the participants. To conduct valid and better activity, "Guide" has to take notice of the whole nature of the group.

5.2. For further research of RAA

In this paper, we proposed the theoretical perspective of group dynamics to investigate RAA. Here, we propose two methodologies for further research of RAA: "Conversation analysis" and "long-term participant observation".

In RAA session, the participants generate new collective behaviors and communication. If the researchers want to examine how the participants reconstruct the collectivity minutely, they have to investigate narratives and stories generated by the participants. Conversation analysis is one of the better methods to examine the issue [19]. If we examine the conversation during RAA session, we can find how the participants treat pet-type robot, how they talk with others about RAA, and how they reconstruct the collectivity in detail.

Additionally, long-term participant observation is a good method to examine the collectivity in which RAA is conducted. If the researcher joins in the collectivity concerned with RAA repeatedly, he can comprehend the tacit premises around the practice of RAA.

Needless to say, these approaches are effective to examine AAT. For further researches and practices, we have to conduct various approaches to investigate AAT and RAA.

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