

Double Bind Situations in Man–Machine Interaction under Contexts of Mental Therapy

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Abstract. This paper suggests some potential negative effects resulting from the application of artificial intelligence to mental therapy. In particular, it focuses on the relations between cultural trends of mental health and the clients' personal traits in mental therapy, and considers the therapeutic effects of robots and software agents based on the theory of double bind situations. Moreover, it reports a current research plan.

1 Introduction

Recently the application of artificial intelligence (AI) to mental therapy has been studied [1, 2]. The ultimate goal of this research is the substitution of therapeutic animals in animal therapy with pet robots, autonomous self-control learning by clients through interaction with intelligent software agents, construction of novel therapeutic methodology, and so on. In Japan, in particular, the decreasing worker population, increasing number of elderly, and the recognized necessity for more sufficient welfare and mental health support have been referred to as the background for these studies.

Our previous research suggested that the artificial emotions of therapeutic robots and software agents may impact negatively on clients of mental therapy from the perspectives of social psychology, sociology of emotions, narrative therapy, and sociology of health and illness [3, 4]. However, the use of computers and robots in the context of mental therapy itself can influence some clients in the modern cultural trend of mental health, regardless of the existence of emotional systems in the therapeutic agents and robots.

This paper deals with the deeper relations between the cultural trends of mental health and the clients' personal traits in mental therapy using software agents and robots, that is, the relations between “psychologism” and anxiety traits for computers and robots. We then suggest that clients of mental therapy using artificial intelligence may be forced into a kind of double bind situation [5]. Finally, we introduce our current research plan to investigate our assumption on the double bind situations of mental therapy clients.

2 Anxiety for Computers and Robots

The concept of computer anxiety means anxious emotions that prevent humans from using and learning computers in educational situations and daily life [6, 7]. Anxiety can generally be classified into two categories: state and trait anxiety. Trait anxiety is a kind of personal characteristics that is stable in individuals. State anxiety can be changed depending on the situation and time, and computer anxiety is classified into this category. From the perspective of education, computer anxiety in individuals should and can be reduced by educationally appropriate programs, and several psychological scales for its measurement have been developed [6, 7].

On the other hand, from the perspective of mental therapy, computer anxiety can influence the therapeutic effect of software therapy using artificial intelligence. If the client's computer anxiety is high, it can prevent interaction with the therapeutic software agents even if the agents are designed based on theories of mental therapy. Of course, communication anxiety should be considered even in therapy with human therapists [8]. However, it can be reduced during the therapy process by the therapist's careful treatment. It is not clear whether computer anxiety can be reduced during the therapy processes by software agents. Thus, anxiety should either be reduced before therapy proceeds or another person should assist clients in interacting with the software agents during the therapy process.

Similar emotions of anxiety should also be considered in robotic therapy. Robotic therapy may be different from therapy using software agents in the sense that robots have concrete bodies and can influence client's cognition. Thus, anxiety with robots may be different from computer anxiety. However, it should be considered that anxiety may be caused by highly technological objects and communication with them. In this sense, anxiety with robots is a complex emotion of computer anxiety and communication anxiety [9].

3 Psychologism

The cultural trend called "psychologism" refers to a trend in modern society where psychiatric symptoms in individuals are internalized although they may be caused by social structures and cultural customs, and, as a result, the root social and cultural situations that need to be clarified are concealed. The Japanese sociologist S. Mori focused on psychologism in discussing the extreme self-control of people in modern society [10]. His theory is based on the theory of feeling rules by Hochschild [11] and the theory of McDonalozation of Society (rationalization) by Ritzer [12].

The theory of feeling rules argues that people in modern society control not only outer expression but also inner evocation and suppression of their emotions according to specific rules corresponding to given social situations, and extreme emotion management in service industries causes the alienation of workers, such as flight attendants [11]. Moreover, the theory of McDonalozation of

Society argues that the principle of rationalization based on efficiency, calculability (quantification), predictability, and control by technology dominates many fields of modern society [12]. Mori's claim based on these theories is summarized as follows:

- In modern society, we are always forced to pay attention to ours and others' emotions in order not to hurt emotionally each other (the worship of individuals' character). Moreover, this worship of individuals' character and psychologism complement each other.
- Furthermore, psychologism and rationalization in modern society also complement each other, and, as a result we are required to have a high degree of emotional self-control.

These statements imply that people in modern society are required to execute emotion management and are dependent on mental therapy for it. In addition, modern rationalism, as Ritzer pointed out [12], may also encourage a reduction of manpower in mental therapy, and, as a result, software and robotic therapy using artificial intelligence may be encouraged. Thus, people in modern society are forced to face therapeutic software agents and robots by the social pressure of the self-control of their emotions and mental health, and rationalism in particular, if mental therapy becomes the duty of members in organizations such as businesses and schools. If these therapies are introduced without consideration of the anxiety that individuals may experience in their interaction with computers and robots, however, they may cause double bind situations for these individuals.

4 Double Bind Situations in Mental Therapy by AI

The Double Bind Theory, proposed as a source of schizophrenia from the viewpoint of social interactions in the 1950s [5], argues that schizophrenia may result from not only impact on the mental level of individuals, such as trauma, but also inconsistency in human communication. The conditions for double bind are formalized as:

1. the existence of one victim (a child in many cases) and an assailant or some assailants (the mother in many cases),
2. the customization of cognition for double bind structures through repeated experience,
3. the first prohibition message with punishment,
4. the second prohibition message inconsistent with the first one at another level (inconsistent situations),
5. a third message that prohibits the victim from stepping out of the inconsistent situation (prohibition of the victim's movement to a meta level of communication.)

It is pointed out that the double bind theory itself has largely not been developed in the theoretical sense since the 1970s [13], and there has not been

enough empirical evidence showing that double bind situations are a source of schizophrenia [14]. Even if the double bind situations are not a source of schizophrenia, however, the double bind theory has been applied in the clinical field as a basic concept of family system theory [15], and it is said that double bind situations frequently exist in daily life.

Under social pressure for the self-control of mental health, therapy using software agents and robots can cause a kind of double bind situation of which clients with high anxiety for computers and robots are victims. The clients are forced to face these systems by social pressure, but they cannot get sufficient therapeutic benefit due to their anxiety for the systems if their anxiety is not reduced by appropriate treatment, due to rationalism in the therapy process. Furthermore, social pressure prohibits them from stepping out of these situations because it signifies their rejection of accountability for their own mental health. In other words, this type of client cannot be treated with software or robotic therapy even if these software agents and robots are designed based on theories of mental therapy.

5 Current and Future Work

In order to verify our conclusion, we should investigate whether double bind situations can arise even in interaction with software agents and robots, depending on situations and personal traits, and how they influence their users. Because of ethical constraints on psychological experiments, we cannot design experiments that really cause double bind situations in mental therapy. Thus, we executed a psychological experiment in which users of a software agent were given double bind messages by the agent [16]. Here, we briefly describe the content and result.

Our experiment was presented as a quiz game by the software agent and the subjects experienced pseudo double bind situations consisting of inconsistent messages from the agent on their answers and prohibition of the subjects' exit from the games by using simple animations. These games were designed based on a double bind model consisting of the theory of feeling rules and some social psychological theories on triad relations [17], and the mental reactions of the subjects were measured by their evaluation of the agent in a questionnaire. These questionnaires consisted of several pairs of adjectives (for example, "violent" – "gentle"), and the subjects selected one of seven grades between both poles corresponding to these adjectives. Then, the scores were compared between the experimental group under the double bind situation and a controlled group. As a result, it was found by t-test that there was a statistically significant difference on one item ($p < .05$, $df = 8$) and significant tendencies at some items ($p < .10$). Although these experiments did not take into account the computer anxiety of subjects as a controlled variable, we are designing a new experiment using the existing questionnaire for computer anxiety [6].

The same experiment should also be designed for robots. However, neither a strict concept of anxiety for robots nor psychological scale for measurement of it has been proposed yet. We are currently constructing a concept of "robot

anxiety” and a psychological scale for it, and will ultimately design experiments using this scale [9].

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