

INTERNATIONAL JOURNAL OF STRUCTURED ASSOCIATION TECHNIQUE

An Electronic Journal of Social Skill, Counseling and Imagery Therapy

NUMBER 2 - AUGUST 2008

CONTENTS

1. Study of Supportive Intervention for Stress Reduction and Perceived Confidence of Child-Rearing Mothers
Kyoko Yajima and Sayuri Hashimoto 3-35

2. Examining Effects of Human Relation Skill Using Genetic Temperament Concept on Stress Management: 3-month-followup Intervention.....
Kyoko Tanaka and Tsunetsugu Munakata 36-62

3. Shift in Frequency of Voice Accompanied with Emotional Change in a Cancer Patient
Kei-Ichiro Kobayashi and Tsunetsugu Munakata 63-75

A Study of Supportive Intervention for Stress Reduction and
Perceived Confidence of Child-Rearing Mothers

Kyoko Yajima and Sayuri Hashimoto

Department of Human Care Science

Graduate School of Comprehensive Human Sciences, University of Tsukuba, Tsukuba, Japan

Correspondence: Kyoko Yajima E-mail Address: kodomonokokoro@nifty.com

Abstract

With increasing numbers of mothers affected by anxiety and stress relating to child care as well as the problem of increasing numbers of abuse cases, support is needed to help mothers develop child-care confidence and alleviate the stress of parenting.

In this study, a 90-minute lecture on child-care support was held for a group of mothers with infants (n=31). The lecture comprised the essential needs of the soul support method utilizing the SAT theory-based guidance method and reward-system images. The purpose of the study was to examine 1) the perceived child-care confidence of child-rearing mothers and the short-term effects of stress reduction around the time of the intervention, and 2) the extended effects for three month after the intervention.

The results were: 1) around the time of the intervention, significant improvements were observed in the level of self-esteem, emotional support network, child-care confidence, self-repression, depression and subjective stress, while a significant reduction was observed in the cortisol level of the saliva; and 2) the

extended effects were raised levels of self-esteem and child-care confidence, and a significant, continual reduction in depression level. Compared with the pre-intervention period, the anxiety trait was significantly lower in the analysis conducted three months after the intervention.

These results suggest that a group intervention using the essential needs of soul support method is capable of increasing mental health conditions and child-care confidence, and providing support for the reduction of child-care anxiety and stress

Key words: child-care support, essential needs of soul support method, self-esteem, child-care confidence, image-script

I. Introduction

Accompanying the reduction in the number of live births and spread of the nuclear family starting in the 1980s, the number of mothers suffering from child rearing anxiety and parenting stress began to increase and the rise in child abuse cases became a serious issue. The number of child abuse cases increased by nearly 17 fold, from 1,961 cases in 1994 to 32,979 cases in 2004, with those cases involving the biological mother accounting for the largest number of child abuse cases.¹⁾ Child-rearing anxiety is one cause of parenting stress,²⁾³⁾ and child rearing anxiety coupled with lack of confidence is believed to lead to child abuse.⁴⁾

The government has adopted various measures to tackle these problems, including the Angel Plan, the New Angel Plan, *Sukoyaka* (i.e., healthy and happy) Family 21, Plus One Proposal to End the Falling Birthrate, and Support for Nurturing the Next Generation. At the community level, support measures include setting up child-rearing support centers and family support centers that provide, among other things, a place of recreation

and relaxation for parents and children alike and a place where mothers can drop off their children while they go out.

In an intervention study of home visitations by nursing professionals to provide postpartum care one month after childbirth, over 90 percent of the participating mothers said that the visitations were useful, as they helped reduce their anxiety and improve their self-confidence, thus suggesting that home visitations by nursing professionals serve as an effective support for child-rearing mothers.⁵⁾ By contrast, in a study of a pediatrician who provided child-rearing guidance in a class for child-rearing mothers, mothers with one month or younger babies said that the guidance did not help reduce their child-rearing anxiety.⁶⁾ A study conducted in a parenting course attended by six mothers suffering from child-rearing anxiety found that although action group work designed to help these mothers develop an effective coping behavior toward their children helped increase their knowledge about behavior modification, it did not result in any systematic change in their actual coping behavior toward child rearing.⁷⁾ Such conventional methods of providing support are basically conduit for conveying knowledge and information for reducing anxiety or stop-gap measures mainly designed to bring about behavioral modification. Thus support is clearly needed to help mothers reduce child-rearing anxiety and stress in a fundamental way.

Stress is perceived when things do not turn as expected,⁸⁾ and today's perception is related to the image-scripts generated by past images.⁹⁾ According to T. Munakata,⁹⁾ our perception or understanding of reality or future predictions are based on scripts that are reconstructed to match our expectations (predictions) drawn from our past knowledge and experience. Additionally, Munakata refers to (i) images based on sensory information input from all sensory spheres (including the sense of smell, taste and balance, somatic sensations,

etc.) and images based on sensory information (including sadness, enjoyment, fear, etc.) that generates value by being stored in the amygdala, and (ii) images based on stories of behavioral information output from these two sets of images as image-scripts. Munakata then points out that today's self-image-scripts are triggered by memories of past images rooted in the growth environment of one's parents.

Image memories differ depending on whether the essential needs of the soul are fulfilled or not. According to the essential needs of the soul theory,⁹⁾ human beings possess three basic needs of the soul expressed: (a) "I want my own needs to be fulfilled with other person's love"; (b) "I want to develop self confidence so I can fulfill my needs by myself"; and (3) "I want to fulfill other people's needs unconditionally with my own love." A negative image of unfulfilled essential needs of the soul formed in the growth environment and the like stored in the amygdala will develop into a trauma, which in turn will make a person more prone to develop a negative self image-script.⁹⁾ Removing a negative self-images script is difficult once it has been formed, and the presence of a negative self image-script makes a person more prone to perceive each of the various stimuli provided by the environment as stress.

It is common knowledge that when a stimulus is perceived as stress, CRH (corticotropin-releasing hormone), which induces the secretion of ACTH (adrenocorticotrop hormone), is released from the hypothalamic area of the brain, ACTH is secreted from the pituitary gland, and the stress hormone cortisol is secreted from the adrenal cortex.¹⁰⁾ Since the cortisol level in the blood is quickly reflected in the cortisol level in the saliva,¹¹⁾ in recent years, four separate studies have been conducted to measure the cortisol level in the saliva as a stress indicator,¹²⁻¹⁵⁾ All four studies found a correlation between the rise in the cortisol level and the increase in stress. Thus it is believed that cortisol triggers a variety of diseases.⁹⁾

From the perspective of the cerebral nervous system, an image is a transfer pattern of a cranial nerve circuit formed when two neurons are joined at a synapse.⁹⁾ The SAT theory asserts that the synopsis connections are strengthened through the creation of cranial nerve activity patterns. These patterns are created (i) by forming a reward-system (positive) image-script that satisfies the cranial nerve activity patterns for a cranial nerve activity pattern that up to now responded only negatively to external stimuli because the essential needs of the soul were not satisfied, and (ii) by acting repeatedly on the basis of that positive image-script over a long period of time.⁹⁾ Under this SAT theory, counseling utilizing images that support behavioral modification and self-growth is provided on a daily basis, resulting in reduced stress.¹⁶⁾ Past studies have confirmed the effectiveness of individual counseling in improving the child-rearing mother's self-esteem and child-care confidence. In order to lower the level of anxiety and stress of child-rearing mothers, it is hoped a support method will be designed to raise the level of their child-care confidence and self-esteem.¹⁷⁾

This study examines, both quantitatively and qualitatively, the short-term effects of intervention and their extended effects three months after the intervention. The objective is to reduce stress and improve child-care confidence for groups of child-rearing mothers in a fundamental way. The intervention is carried out by using the essential needs of soul support method using a guidance method based on the theory and technique of SAT support method and the reward-system images that fulfill the essential needs of the soul.

II. Research Methods

1. Targets and survey methods

With the cooperation of the healthcare center of Town A, Prefecture S, a group of child-rearing mothers

were selected as the intervention group using a snowball sampling technique and urged them to participate in a “child-rearing support course.” A total of 31 child-rearing mothers participated in the course, five of whom either came late or were not rearing a child at the time of the intervention. Thus 26 of the 31 participants (84%) were targeted for the analyses. Sixteen of the original participants (62%) cooperated in the analyses conducted three-month after the intervention.

With the cooperation of the Town A health center, the same snowball sampling method was used to select a group of child-rearing mothers as the non-intervention group and the first survey was conducted while the intervention group was participating in the child-rearing support course. Questionnaires were distributed to all 17 mothers of the intervention group. They all filled out the questionnaires and returned them. Seven child-rearing mothers (41%) cooperated in the second survey, which was timed to dovetail with the three-month after analysis of the intervention group.

For the intervention group, the pre-course questionnaires and post-intervention questionnaires were collected in individual envelopes before and after the course, respectively. For the non-intervention group, the questionnaires were distributed at the healthcare center and collected in individual envelopes. In the survey conducted three months after the intervention, a questionnaire packet enclosed with a return envelope and a written request for cooperation was mailed out to each participant and collected through the mail. The survey was conducted over a period of three months, from August to November 2004.

In this study, around the time of the intervention, samples of saliva were taken using the essential needs of soul support method to measure the cortisol level in the saliva of the participants as a stress indicator. Since saliva secretion reacts sensitively to stress, the saliva sampling was taken during rest hours.

Out of ethical consideration, this study was subject to epidemiological review by the Tsukuba University Ethics Committee and approved. Before implementation, among other things, the authors explained in writing that the objective of the study and stressed that cooperation in the study was optional, that the respondents were free to decide whether to put down their names or not, that the answers they write down should reflect their own views, and that the collected data will be treated quantitatively. For those participating in the child-rearing support course, the authors verbally explained the purpose of the course and asked for cooperation. The participants agreed to cooperate. Those in the intervention group were asked to submit a certificate of consent, which they did.

The standardized Japanese versions of two existing psychological scales were used: the State Trait Anxiety Inventory ¹⁸⁾ and the Self-Rating Depression Scale. ¹⁹ The developers of both scales consented to the authors' request to utilize them.

2. Composition of the questionnaire

The questionnaire consists of existing psychological scales on child-care confidence, and child-care anxiety (whose attributes, reliability and validity have been reviewed). Table 1 shows the contents of the scales and the alpha coefficients ascertained in the study.

Table 1 Composition of the questionnaire

Scale	Developed	Item	Score	Content of measurement	coefficient
1 Self-esteem	Rosenberg 1965,Japanese version Munakata et al 1987	10	0 ~ 10	Measures the degree of affirmative self-image.	.860
2 Self-repression	Munakata 1996	10	0 ~ 20	Measures the inclination to repress one's feeling or thoughts so that others do not come to dislike the individual.	.772
3 Emotional support network	Munakata 1996	10	0 ~ 10	Measures the degree of awareness of emotional support from family and others, respectively.	.854
4 Problem-solving	Munakata 1990	10	0 ~ 20	Measures the tendency toward effective and positive problem-solving.	.652
5 Interpersonal dependency	Hirschfeld1977,compiled by P.McDonald Scott	18	0 ~ 18	Measures the degree of excessive interpersonal dependency.	.742
6 Trait anxiety (STAI)	Spielberger 1970,compiled by Mizuguti et al	20	20 ~ 80	Measures the tendency to feel anxious.	.912
7 Depression (SDS)	Zung 1965 compiled by Hukuda	20	20 ~ 80	Measures the tendency towards depression.	.841
8 Child-care confidence	Yajima et al 2004	10	10 ~ 40	Measures the degree of the child-care confidence.	.880
9 Child-care anxiety	Extraction from Profile-scale by Kawai et al 1997	13	13 ~ 52	Measures the degree of the child-care anxiety.	.853

3. Method of intervention

The intervention was conducted by two SAT counselors licensed by the Academy of Health Counseling.

The intervention lasted 90 minutes – 30 minutes for guidance, 45 minutes for on-site training, and 15 minutes for filling out the post-intervention questionnaire.

4. Contents of the Intervention

(1) The intervention involved on-site training using the method of communication with children based on SAT therapy, the essential needs of soul theory, the guidance based on the flashback theory, and the essential needs of soul support method.

(2) What is the essential needs of soul support method?

The essential needs of soul support method is based on the essential needs of soul theory. The method

is built from the three techniques discussed below to help child-rearing mothers cope with the problems they currently face by (a) creating a positive image-script that fulfills the essential needs of the soul that are at present unfulfilled, and (b) by using the positive image-script formed with the essential needs of soul method even if there is a negative image-script that flashes back, and forth between past and future at the time of stress perception. Additionally, free-description sheets used to have the participants indicate for each of the three techniques discussed below their subjective stress levels, their impressions, and the way they cope with stress.

(a) Making physical contact: In this technique, the participants, in pairs, empathetically make physical contact.

This is done by imagining the person one loves with the region or force one prefers and in such a way that a signal of unconditional love is sent from one's hand to the hand of the person one is paired with.

Noradrenalin is secreted when stress is perceived, and this causes symptoms to appear in various regions of the body. ⁹⁾ The physical contact technique aims to control negative emotions, promote pleasurable sensations and reduce the present somatic symptoms by inducing the release of dopamine and serotonin from the brain by producing somatosensory stimuli through physical contact.

(b) Forming a favorable inner-womb image and love signaling method: These techniques aim to help the participants fulfill the essential needs of their soul by having them create a favorable image of themselves in their mother's womb by applying structured regressive hypnosis and offering words that convey a signal of love so that the participants will be able to hold a positive image-script, and thereby weaken the flashback of negative images from the past and also apply that same positive image-script for the coming child.

(c) Forming a future self-image: This technique aims to fulfill the essential needs of the soul by creating and forming an image of the self enjoying life and living with exuberance and full of confidence. The technique also aims to help child-rearing mothers perceive the self acting in accordance with one's own values believes.

5. Analytical method

The survey results were analyzed using the statistics analysis software SPSS Ver. 11.0. The Friedman test was then administered to evaluate changes in the participants' subjective stress level during the intervention, the effects of psychological traits on their stress level around the time of the intervention, and the extended effects of the intervention. For the purpose of multiple comparisons, after administering the Wilcoxon coded ranking test, corrections were made using the Bonferroni inequalities

III. Findings

1. Average psychological trait values of child-rearing mothers

Average psychological trait values of a total of 43 child-rearing mothers (belonging to either the intervention group or to the non-intervention group) were calculated and the following results were obtained: the self-esteem level rose 6.16 points; the self-suppression behavioral trait level, 9.14 points; the emotional support network family level, 8.53 points; the other than family level, 8.14 points; the problem solving behavioral trait level, 10.44 points; the interpersonal dependence type behavioral trait level, 6.53 points; and the trait anxiety level, 43.86 points

2. Comparison of the basic attributes and psychological trait of mothers in the intervention group and those in the non-intervention group

Table 2 shows the results of the Mann-Whitney test on the intervention and non-intervention groups administered to determine whether it is possible for the non-intervention group to serve as the control group in terms of basic attributes and psychological traits. Although differences were observed in the case of the mother's age and the age of her spouse, no significant differences were found in the case of other items. Thus it was concluded that the non-intervention group cannot serve as the control group.

Table 2 Comparison of the basic attributes and psychological traits of mothers in the intervention group and those in the non-intervention group, changes around the time of the intervention (intervention group n=26, non-intervention group n=17)

	Intervention group			Non-intervention group	Both crowd comparison
	Mean value before intervention	Mean value after intervention	p-value	before	p-value
Age of person in question	32.12 (±4.11)			28.94 (±2.33)	.013
Age of consort	34.81 (±5.93)			30.88 (±3.36)	.049
Number of those who cohabit	4.50 (±1.50)			4.06 (±1.44)	.305
Number of children	1.58 (±0.86)			1.41 (±0.51)	.819
Self-esteem	5.96 (±2.76)	8.04 (±2.03)	.000	6.47 (±2.38)	.707
Self-repression	9.58 (±3.36)	8.77 (±2.70)	.070	9.18 (±3.43)	.644
Emotional support network(family)	8.58 (±2.04)	9.35 (±1.55)	.007	8.48 (±2.50)	.883
Emotional support network(others)	8.12 (±2.49)	8.81 (±2.25)	.007	8.18 (±2.63)	.655
Problem-solving	10.58 (±3.01)	10.27 (±2.66)	.542	10.24 (±2.56)	.515
Interpersonal dependency	6.77 (±3.37)	6.35 (±3.69)	.289	6.29 (±3.18)	.546
Trait anxiety (STAI)	43.12 (±11.43)	41.65 (±10.80)	.252	45.12 (±9.56)	.384
Depression (SDS)	40.15 (±9.02)	37.46 (±7.55)	.005	41.12 (±7.96)	.645
Child-care confidence	26.46 (±5.37)	29.81 (±4.61)	.000	28.41 (±4.29)	.178
Child-care anxiety	23.19 (±6.42)	23.50 (±7.00)	.806	21.76 (±4.86)	.508
Cortisol level in the saliva	0.28 (±0.12)	0.23 (±0.09)	.002		

3. Changes in psychological traits and child-care self confidence around the time of the intervention

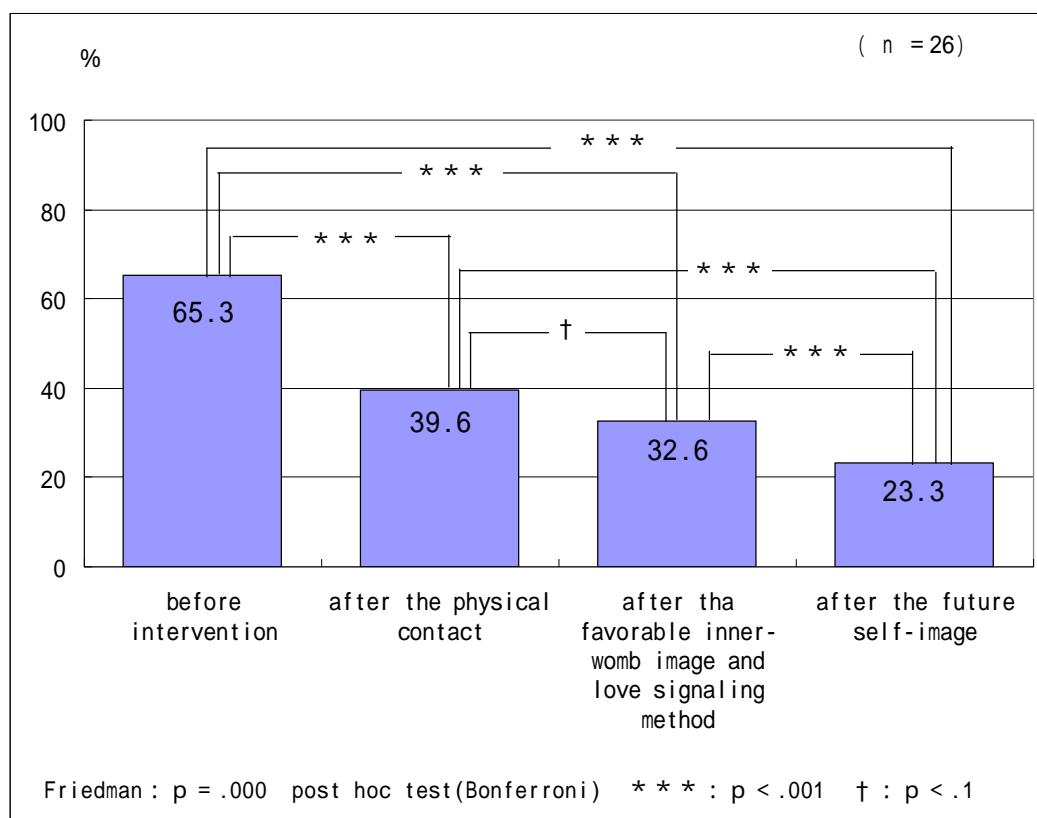
Changes in psychological traits around the time of the intervention are shown in Table 2. After the intervention, the average score rose significantly for self-esteem, family with perceived emotional support, other

than family, and child-care confidence, while the average score for depression and self-suppression behavioral traits tended to decline. However, no significant differences were found around the intervention for problem solving behavioral traits, interpersonal behavioral traits, anxiety traits, and child-care anxiety.

4. Changes in the subjective stress level during the intervention using the essential needs of soul support method.

Figure 1 shows the results of an assay of descriptions of stress levels the participants wrote down in the free description sheets distributed to them to determine the effect of the intervention on their subjective stress level around the time of the intervention. The average value of the subjective stress levels before the intervention declined significantly in each technique.

Figure 1 Changes in the subjective stress level during the intervention



5. Regarding the change in cortisol level in the saliva around the time of the intervention using the essential needs of soul support method

The cortisol level in the saliva was measured to ascertain the effects of the intervention around the time of the intervention. After the intervention with the essential needs of soul support method, the cortisol level in the saliva declined significantly (Table 2). Additionally, correlational analyses (Spearman) were conducted to observe the relationship between the cortisol level and the variation in the psychological traits around the time of the intervention ($\rho=.440$ $p=.024$) and the variation in the child-care anxiety level ($\rho=.404$ $p=.01$)

6. Comparison of the psychological traits of child-rearing mothers in the intervention group and those in the non-intervention group before the intervention and three months after the intervention

With regard to the intervention group ($n=16$) and the non-intervention group ($n=7$), the average value of psychological traits before the intervention and three months after were compared. The age of the child-rearing mothers in the non-intervention group was significantly lower (intervention group: 32.131 [± 4.34] years old; non-intervention group: 28.14 (± 2.4) years old, $p=0.21$). Before the intervention, the average child-care confidence level tended to be significantly higher for the non-intervention group ($p=0.003$) and the average

depression level tended to be lower ($p=0.56$). Three months after the intervention, no significant difference was observed between the two groups (for the scores obtained, see Tables 3 and 4).

Table 3 Change of the psychological traits in the intervention group before and three months after the intervention (n =16)

	Mean value			Friedman p-value	-	-
	before	after	three months after			
Self-esteem	5.13 (±2.94)	7.75 (±2.38)	6.56 (±2.58)	.000	p<.01	p<.01
Self-repression	10.13 (±3.38)	9.06 (±2.89)	9.31 (±2.92)	.601		
Emotional support network(family)	8.25 (±2.11)	9.25 (±1.81)	7.94 (±2.91)	.111		
Emotional support network(others)	7.69 (±2.94)	8.56 (±2.76)	7.75 (±3.53)	.067		
Problem-solving	10.25 (±3.36)	10.25 (±2.84)	10.13 (±4.67)	.645		
Interpersonal dependency	7.06 (±3.42)	6.63 (±3.67)	5.94 (±4.01)	.154		
Trait anxiety (STAI)	46.88 (±12.37)	44.25 (±12.20)	43.50 (±11.79)	.219		
Depression (SDS)	43.94 (±8.04)	40.38 (±7.50)	40.25 (±8.93)	.004	p<.05	p<.05
Child-care confidence	24.25 (±5.30)	28.38 (±4.84)	27.00 (±4.24)	.002	p<.01	p<.05
Child-care anxiety	25.38 (±7.11)	25.63 (±7.70)	24.13 (±6.89)	.442		

Table 4 Change of the psychological traits in the non-intervention group before and three months after the intervention (n = 7)

	Non-intervention group		
	Mean value before	Mean value three months after	p-value
Age of person in question	28.14 (± 2.04)		
Self-esteem	7.14 (± 2.27)	7.86 (± 2.41)	.059
Self-repression	9.71 (± 3.04)	9.57 (± 3.41)	1.000
Emotional support network(family)	9.43 (± 1.13)	9.57 (± 0.79)	.317
Emotional support network(others)	8.71 (± 2.63)	9.14 (± 1.57)	.317
Problem-solving	10.86 (± 1.46)	9.57 (± 1.72)	.202
Interpersonal dependency	5.43 (± 0.98)	7.14 (± 3.13)	.140
Trait anxiety (STAI)	41.86 (± 6.31)	37.86 (± 10.29)	.223
Depression (SDS)	36.71 (± 6.24)	36.00 (± 7.72)	.674
Child-care confidence	30.29 (± 2.93)	30.43 (± 3.46)	.891
Child-care anxiety	22.86 (± 5.40)	21.43 (± 6.73)	.352

7. With regard to the extended effects for three months after the intervention

In order to measure the extended effects of intervention in the intervention group, the effects were measured before, immediately after, and three months after the intervention. Improvements in self esteem and child-care

confidence and decline in depression were sustained at a significant level for three months after the intervention (Table 3). In the non-intervention group, no significant change was observed (Table 4).

8. Change in the mother's subjective stress level three months after the intervention

Table 5 shows (a) all the cases involving the subjective stress of child rearing written in the free-description

Table 5 Stresses mothers are aware of and changes after three months (n=16)

	Stresses mothers are aware of:	Three months later 3ヵ月後
Example 1	The mother had anxiety with regard to the independence of her child (toilet habits, changing of clothes, eating manners etc. Due to lack of support from other family members, the child depended totally on her resulting in the sense of having no free time of her own.	She tries not to reproach the child outright, has focuses of attention besides child-raising through reading newspapers and books during the child's napping. She feels now she is back to her old self and deals with the child without undue stress.
Example 2	The mother had anxiety about the child's relationship with other children in the daycare center, and about the child's development of motor abilities. When in a hassle, gets crabby if the child asked the same question over and over.	She tries to look at on the child's characteristics as positive as opposed to negative traits.
Example 3	The mother felt she wasn't taking good care of the elder child, because the younger one took so much time. Small things got on her nerves very easily. One reproach led to another and lost track of things. She got carried away often.	She can put herself in her child's shoes and takes a breather before scolding the child. Finds herself more affectionate toward the child. Has started to do something she always wanted to do. The adult course has prompted talk with her family, and gets more help now from them.
Example 4	The child played with its baby food and it got on the mother's nerves. Got distracted from household work. Lack of sleep.	She feels more secure in looking after the child. Gives a hug whenever the child comes near. When upset, magic words of love restores her to her love of the child.
Example 5	The younger child never stayed away from her, and that left very little time to look after the older one, which caused frustration on the mother's part. The older child wanted to be cuddled but tried not to show it and it broke her heart. She also worries the older child is under stress about it.	She gets help so she can be alone in the park or in town. She can listen to the child's talk without getting mad. Takes more care now than before to give praise to the child about what the child has accomplished. The husband looks after the younger child while the mother and the older child go out in town and have heart-to-heart talk so that the mother feels more secure.
Example 6	The mother has no confidence in child-raising. Tend to shout or slap when the child is disobedient. She feels she is not doing any positive thing for the child's inner development.	She takes a breather now before reproaching and stays away from slapping the child.
Example 7	The mother felt the boys were close in their ages that they quarrel often. When she is rushing things as in the morning, she got upset and scolded the children.	She tries to breathe deeply when upset, and tries to recall when she was little and loved by the parents. Tries also to be well rested in body and mind.
Example 8	The mother got very upset when the child made a mess or loud noises, especially when she was not feeling well. She feels at odds with her mother-in-law regarding how to raise a child.	Tries to have a breather before bursting into reproach. Tries not to shout at the child and ask the child what the child think is the problem. Feels now she is making progress toward really communicating with the child.
Example 9	The child is very particular about food. The child stays up late at night and sleeps till late in the morning so that early hours are never kept.	She now gets someone to look after the child so she can clean the rooms or go out shopping for distraction. When she gets mad, she makes up by giving kind words. She believes now that children gets wiser as they grow older. Feels relieved when she sees the child play with the child's grandparents.
Example 10	The child was a pest once the child starts to play outside the house. The child never wants to come inside the house. Usually takes a half hour and delays the household work. The mother got frustrated. The child stays up late and that cuts the mother's quiet time to her frustration.	The husband takes care of the child on weekends or the family go out to enjoy themselves. The mother tries not to get upset and give praise to the child. Tries to not to discourage the child to do whatever the child wants to do.
Example 11	The child's mannerism of words and behaviour were exactly the same as the mother's and it got on her nerves. When the child did not volunteer to help her or could not do things on his/her own, she tries to cajole or scold until the child started to cry. Sometimes slapped the child when the child is disobedient. The mother felt that the child did not care how she was feeling or how tired she was.	She now hugs her child when the child accomplished something, although the child is in grade school. She is now able to give encouraging words to the child. She can avoid now to get upset and is able to talk about the facts and her feelings without getting worked up.
Example 12	The asked the mother or grandmother to help with things the child can do on its own.	The mother tries to attend child-raising group. Asked her husband to read its handouts and now he has better understanding about stresses with regard to child-raising.
Example 13	The mother tended to get angry with the older child even when the child was not doing anything wrong. She blamed herself for it and added to the stress further.	She tries to improve the situation though cleaning up of her house or taking the child out with her, but basically the problems remain just as they were three months before.
Example 14	The mother's mother looked after her son only when she felt like it, not when the mother wanted her to. Sometimes the grandmother butts in when the child is enjoying itself without anybody near. The husband did whatever he wanted even while her pregnancy, such as golf, skiing, drinking parties. The mother felt she has been cutting down all her pleasures.	She is glad she took the consultation. The comments were detailed and to the point.
Example 15	The child got on the mother's nerves when the child asked her to do the same thing over and over again. Also, when the child was naughty and wouldn't listen to her caveat. And when the child was being mean to other children and they got angry at the child.	She now takes a breather before dealing with the situation. She feels she is more confident in looking after the child
Example 16	The mother always has the day's plan but the children's behaviour and mischiefs sometimes make things go awry, and that got on her nerves. The worry that the children might catch cold is a big stress inducer for the mother. The third and the youngest of the three made everything dirty with its hands and food.	She feels now she knew herself better. She feels sorry for herself because she was always getting upset. She wants to make the most of the courses she took.

sheets during the intervention using the essential needs of soul support model, and (b) the stress coping methods and changes in the mother's attitude toward the child described in the survey three-month after the intervention.

IV. Discussion

In this study, direct intervention of a group of child-rearing mothers was implemented by applying the SAT theory-based guidance method and the essential needs support method. The effects of the intervention was then examined, both quantitatively and qualitatively, on the basis of the changes in the psychological traits of the child-rearing mothers observed around the time of the intervention and three months after the intervention, as well as on the basis of the impressions they wrote down in the free-description sheets.

1. Regarding the present state of child-rearing mothers

Child rearing is a regular part of life, but at the same time, it is said that a child-rearing mother is in a peculiar situation characterized by many stressors. Stress is perceived when things do not go as expected, and when a stress is perceived negatively, self control of feelings, behaviors and bodily functions declines, resulting in the appearance of somatic, behavioral and neurological symptoms.⁸⁾

The subjective stress that emerges from the free descriptions provided by the child-rearing mothers in the study shows neurological symptoms such as: "I get irritated when I compare my baby with other babies"; "I become irritated and lose my temper when my baby doesn't listen to me"; or "I become irritated when I can't do the household chores [because I have to take care of my baby]." The mothers' subjective stress is also

manifested in behavioral symptoms such as: "I get mad at my baby easily"; "I find myself shouting at my baby"; and "I often hit my baby." With regard to somatic symptoms, in the free description distributed during the intervention, the participants were asked write down where they felt most uncomfortable when they were under stress. Their answers contained a large range of symptoms including stiff shoulders, stomach ache, lower back problem and headache. From these stress symptoms, it is possible to infer that child-rearing mothers are under a lot of stress.

The self-esteem of mothers in this study was 6 points, and from the interpretation of this measure, ²¹⁾ mothers in this study have low self-esteem and negative self-image. And given that their average value for trait anxiety was 44 points, (which is considered high), while their average value for depression was 40 points, (which means they are in a light depression territory), it is hardly possible to say that the mothers in this study are in good mental health. It is can be assumed that the mothers' stress symptoms and poor mental health, conveyed either directly or indirectly through their expressions, tone of voice, attitude and so on, have a negative impact on their children. ^{22) 32)}

2. Regarding the intervention's short-term effects

After the intervention using the essential needs of support method, the self-esteem level, awareness of emotional support level and child-care confidence level were improved, while the self-repression level and depression level were lower.

Stress is closely related to the image of the situation that has triggered the stress. According to a report by Hashimoto et al, ²⁴⁾ in image research it is said that when one has a good image of one's parents, one tends

to also have a good self-image, and good self-image is said to be conducive good mental health, but no study has been done to determine how self-image can be improved. Additionally, according to a study by Higuchi et al,²⁵⁾ there is evidence that having a positive image-script of one's parents has an effect of changing one's mental health in a favorable way. Group intervention was carried out in this study with the view to improving the participating mothers' self-image and the image of their parents by using the SAT physical contact method, favorable inner-womb image method, love signaling method, and future self-image method.

The somatosensory stimulus triggered by physical contact releases dopamine and serotonin from the brain, which in turn repress negative emotions and heighten the feeling of pleasure, thereby reducing stress.²⁰⁾ The SAT physical contact method used in carrying out the intervention of this study works directly on the pain and discomfort the body feels when it is under stress. First, the participants are instructed to form an image of the stress they currently feel and perceive the discomfort and pain felt by the body, and reduce the discomfort and pain by instinctively answering the question "What part of the body do you want me to stroke?" These steps activate the intuitive faculties of the brain's right hemisphere in a manner peculiar to the SAT method. Stroking the other party endearingly where she wants to be stroked and with the amount of force she desires releases serotonin in the brain, thereby easing the stress felt by the body. This reduction of the stress felt by the body is believed to be what enables the patient to feel psychologically good or relaxed. The level of subjective stress is reduced to its lowest level after the physical contact. The impressions the participants had after the physical contact included "I feel comfortable"; "I feel relaxed"; "I feel lighter"; and "I feel safe," suggesting that the intervention using the SAT physical contact method had the desired effects. It is believed that the support of others can be perceived by experiencing a feeling of comfortableness and feeling of security through the touch

by others, thus raising awareness of the emotional support being provided.

The awareness and emotions one has today are influenced by the past and future images that exist in the subconscious. One is unable to exercise self-control when one develops stress because there is a flashback of negative images stored in the mind.⁹⁾ However, in the SAT theory-based guidance method or image therapy, support is provided to help patients modify their behaviors or achieve self-growth usually by urging them to recall images of past traumas and transform their negative image-scripts to positive ones. However, in the group intervention conducted for this study, the participants are urged to form a positive image-script from the inner-womb stage to the infant stage without having to recall past traumas by using the favorable inner-womb image method and love signaling method. Images represent cranial nerve activity patterns, and for the brain, whether the images are perceived images rooted in experience or imagined, and even if they contain different quantities of information, the path through which the brain is aroused is the same.⁹⁾ That is to say, forming imagined images using the favorable inner-womb method and love signaling method enables one to freshly form cranial nerve activity patterns of positive images of being amply loved and accepted from the inner-womb period to the infant stage. Recalling an image of being loved in the past enables some people to change the image they have of their parents and even their own self images in a favorable way, thus in turn enabling them to improve their self esteem.

In addition, the present is also influenced by future images. If one is able to imagine the future in a positive way, one will also be able to perceive the present in a positive way.⁹⁾ The future image method used in this study guides the child-rearing mother to imagine the future and form a fresh positive image-script based on that imagined image of the future. According to humanistic psychology,^{26) 27)} human are by nature

autonomous beings with goals and values and are capable of self-determination, and mental health is realized in the process of self-realization. However, it is probably the case that the degree to which one is able to hold a favorable self-image plays a part in self-determination that makes self-realization possible. It is believed that by developing a positive image-script in which the future self is portrayed as free and self-confident, one is able to perceive the self in its true light and the self-image is changed in a favorable way, that is, in a way that shows the self able to choose a way of life that holds the self dearly, thereby improving one's mental health and lowering depression.

Earlier it was pointed out that the essential needs of soul support method is a support method that fulfills three basic needs. According to Munakata's soul development theory,²⁸⁾ the period between infant and later childhood is the period when one is recognized and loved by a significant other (fulfillment of the desire to be loved). Munakata cites the inability of one's parents, one's first significant others, to resolve the problems of self-repression and dependence of their souls as a factor that prevents resolution of problems that arise when one is an infant. Self-repression and reliance on others are formed by a feeling of being affection-deprived or receiving only conditional love (as opposed to unconditional love) in the process of growing up. That is to say, by not being loved unconditionally by one's significant others in the process of growing up, the parents themselves developed a proclivity to suppress their feelings and depend on others, which continued into their adulthood. The mother herself is designed to fulfill her desire to be loved because she is so worried about how others view her that she does not have her own standard of judgment, but has such a strong expectation of others that she lacks the confidence required for self-determination. Thus she is unable to give her children unconditional love, and finds herself shouting at them when they do not listen to her. The latter is a manifestation of her dependence

on her children. Properly speaking, the level of self-repression and dependence on others need to be lowered before these issues can be resolved. However, in this survey, although there was a tendency for the level of self-repression to become significantly lower, there was no change in the average score on the dependence of others measure.

One reason there was no clear change in the self-repression level is that no self-assertion training was provided. The actual amount of housework and work related to child-rearing did not change. Since the soul wants self-repression, even if the wife feels a desire to have her husband help in child-rearing, she concludes that she should not ask her husband to help. Because she is unable to ask, her desire to have her husband understand how hard it is to keep the house and at the same time raise children and the sense that she wants him to help remains unfulfilled. Moreover, limiting its objective to clarifying the nature of stress in child rearing, the survey clarified the impressions the participating mothers gave for each support method, their method of coping with stress and awareness of its presence, and in the process of clarifying these points, the participating mothers developed the skills for making physical contact with their children as a way of coping with stress. However, it is unclear whether the intensity of the feeling of dependence on others as expressed by their desire to get their toddlers to listen was completely reduced, although evidence suggests it remains. Thus it can be inferred that in this survey the score on the dependence on others measure did not change, and it can be expected that the level of self-repression and dependence on others may be lowered by repeatedly applying the essential needs of soul support method.

In this study, in order to measure the stress reduction effect of the essential needs of support method, the cortisol level in the saliva of the participating mothers was measured around the time of the intervention. The

standard cortisol level in the saliva is said to range in the vicinity of 0.03 to 0.2 μ g/dl with the level being high in the morning and low in the evening.¹⁰ In this study, a quiet rest time was provided to eliminate the impact of the rise in the stress level at the time the participating mothers arrived at the health center. The cortisol level for each participant was measured at around 11 am (before intervention) and around 11 pm (after intervention). Thus the impact of the time of the day factor was kept to a minimum. The average cortisol level in the saliva of the participating mothers was 0.28 μ g/dl, suggesting that the mothers targeted in this study were under stress. The cortisol levels in their saliva were significantly lower after the intervention. In addition, a correlational analysis of the degree of change around the time of the intervention found a correlation between the degree of change in the trait anxiety level and the degree of change in the child-care anxiety level, suggesting that the essential needs of soul support method was effective in reducing the psychological stress of child-bearing mothers.

According to the contents of the descriptions entered in the free-description sheets distributed during the intervention using the essential of soul support method, the average subjective stress level before the intervention was 64.5%, but it declined to 39.6% after the physical contact intervention and to 32.6% after the application of the inner-womb image method. Then, after the future self-image method was applied, it declined significantly to 23.4%. As a result of these changes, together with the decline of the cortisol level in the saliva, it can be inferred that the intervention had an effect in reducing the stress perceived at the present. Moreover, since the individual techniques were all effective in reducing stress, intervention using one of the techniques is believed possible.

2. Regarding the extended effects of intervention

Quantitative changes in psychological traits and child-care confidence and quantitative changes in attitude toward children, both recorded three months after the intervention, as well as changes in stress levels achieved through the application of stress-coping methods were studied qualitatively. In the quantitative changes, improvements in self-esteem and child-care confidence as well as the declines in depression were sustained significantly. Around the time of the intervention, the child-care confidence level of the intervention group was significantly higher and their depression level was significantly lower, while mothers in the non-intervention group were caring for their children with more confidence and less stress. Three months after the intervention, the level of self-esteem tended to rise significantly in the non-intervention group, but there was no statistically significant difference between the two groups. It can be inferred from this that there was no significant difference precisely because significant improvements in self-esteem and child-care confidence and a significant decline in depression were both sustained among those in the non-intervention group. Moreover, changes in attitude toward one's children and changes in actions taken toward oneself could be inferred from the responses the child-rearing mothers gave in the questionnaire survey conducted three months after the intervention. This suggests that, based on quantitative and qualitative analyses of the data, the essential needs of support method has the extended effect of improving the levels of self-esteem and child-care confidence, thereby reducing child-rearing anxiety and stress of mothers.

The participating mothers said that they felt comfortable and safe after the intervention using the SAT physical contact. Given that the state of a mother's soul impacts her attitude toward child-rearing, Hashimoto S.²⁹⁾ states that child-rearing mothers should create an environment where their children can feel reassured and receive safe and unshakable love unconditionally by (i) sending out a lot of messages of unconditional love, (ii)

realizing their susceptibility to respond emotionally to suit their own convenience, and (iii) letting their children go through experiences that will fulfill the three basic desires of their soul. It is believed that to be able to send out safe and reassuring signals to their children, first of all, mothers need to be able to relax as when the physical contact method is applied. Moreover, although physical contact with babies, such as the post-delivery kangaroo care and touch care, are stressed, ³⁰⁾ it is believed that knowing how good it feels to have physical contact enables mothers to hug their own children. However, in the questionnaire survey conducted three months after the intervention, the participating mothers said they changed their behavior, as in: "I hugged my daughter when she crawled close to my feet"; "I hug my daughter even though she's in school now."

Moreover, from the viewpoint of what Hashimoto S. terms "the ease with which mothers respond emotionally to suit their own convenience," ²⁹⁾ it is significant that the participating mothers made such comments as: "I lose my temper, despite myself, and end up screaming at my baby"; "The more difficulty I have figuring out what's making me angry, the more angry I get"; and "When I'm inundated with housekeeping chores, I get irritated and find myself scolding my baby." But three months after the intervention, the same mothers showed behavioral modification, that is, changed the way they thought about their kids, the way they expressed their love for them, and how they accepted them into their heart. Here are some examples "I've learned to see things from my child's perspective. I pause to take breaths to control my anger and avoid unilaterally scolding him"; "My baby seems much cuter than before": "I'm more sensitive to my baby's needs now than I used to be." "When I'm about to lose my temper, I take a deep breath and recall my childhood days when I was really loved. I do my best to slow down and relax more."

The reason the intervention had positive effects may be that the significant rise in self-esteem level and

child-care confidence level, coupled with the significant reduction in depression level, enabled mothers to be more relaxed with their babies, thus rendering the interaction between mother and child more comforting. Additionally, as can be seen by the comment, "Recalling the words used in the love signaling method at a time when I was irritated enabled me to show real affection for my baby, which I couldn't do before," even when mothers had flashbacks of negative images, by repeatedly changing their attitude toward their children by applying the positive image-script formed in their minds further strengthened that active pattern and enabled mothers to continue forming the positive image-script even three months after the intervention.

Three months after the intervention, not only was there modification in the mothers' behavioral toward their babies, there was also modification in the mothers' behavior toward themselves. The mothers continued to behave in a way that placed importance on the self, as in "Now I'm interested in things other than raising my baby. When the baby's asleep, I read a newspaper or a book I've wanted to read. I've pulled myself together, so now, I can as a human being, calmly face my baby," or "I've taken up something I've always wanted to do." "I set aside time to be alone," or "For a change of air, I take my baby to a park or take her out with me." This suggests that undergoing the intervention using the future self-imagining method helped the mothers find what they really want to do, thus enabling them to modify their behavior.

It is believed that, thanks to these favorable behavioral modifications, the mothers in the intervention group were able to continue to direct their coping behavior at their children and at themselves, resulting in the continued improvement of self-esteem and child-care confidence, thereby enabling these mothers to continue lowering their depression level. Regarding child care anxiety, Kawai N. et al ¹⁷⁾ believes that, since mothers' psychosomatic condition is related to the psychosomatic condition of their children, their tendency to be anxious

about child-rearing is believed to originate in their lack of self-esteem and feeling of incompetence and helplessness. Kawai et al point out the necessity of intervention centering on assistance to mothers to develop a proper sense of motherhood, and it can be said that the essential needs of soul support method, which supports the change in lifestyle to one that places importance on the mother's attitude towards her child and herself by increasing her self-esteem and child-care confidence, is precisely the kind of support designed to assist mothers to develop such a sense of motherhood.

The foregoing discussion describes the extended effects of the essential needs of soul support method, but it is unreasonable to think that the method, as it is, will be effective for everyone. Consequently, for improving the essential needs of soul support method, it is important to examine the cases where mothers were not able to effect behavioral modifications either towards their child or toward themselves.

In case 12 of the analysis conducted three months after the intervention, the mother remarked, "I had my husband read the description I wrote down. I think that helped him understand why I was so stressed out caring for our baby." But the mother did not say that the intervention helped change their behavior toward themselves or their children. In case 13, the mother said, "The situation has not changed," showing that the intervention was not effective. The psychological traits that characterize case 12 were: low levels of self-esteem, emotional support awareness, child-care confidence, and high levels of self-repression, problem avoidance, reliance on others, trait anxiety, depression, and child-care anxiety. An infant treated for a psychogenetic visual impairment is cited in a study undertaken by Higuchi N. et al. ²⁵⁾ Right after the treatment, the mother showed some signs of improvement, but later relapsed. She manifested the following characteristics: a high level of anxiety, self-repression, and reliance on others, and a low level of self-esteem and support awareness. These are the

characteristics of mothers who did not show any extended effects three months after the intervention, but they resemble those observed in case 12. The mother in case 12 wrote down in her free-description sheet, "I recall being alone as a child," suggesting that she has a negative image of her parents as she grew up.

The psychological traits that characterize case 13 were: a low level of reliance on other and a high level of problem avoidance, and a low level of child-care confidence. The mother acts in ways that avoid problem solving, as in: "I'm overwhelmed by what I have to do every day" and "I clean the house just to relieve stress, or take my baby out to a department store or the like where we just walk around." Here, the mother seems neither to understand nor accept how the child feels, as when she says, "I gets emotional and take it out on my kid." In her free-description sheet, the mother remarks, "I end up recalling my real parents and the environment I grew up in, and marvel at how lucky babies are when they are brought into this world by parents who love them as depicted by this image," reflecting the negative image she has of her parents.

Common to these two cases where neither mothers got good results from the intervention is that they both have negative images of their parents in the environment they grew up in, and frequently resort to problem avoidance. The high level of problem avoidance means that these mothers are so anxious about child-rearing that they are unable look straight at the problems. As a result, they are susceptible to becoming excessively optimistic and are likely to turn their backs on reality on regular basis.³¹⁾

From the foregoing discussion, the method of intervention adopted in this study by itself is believed to be inadequate to enable parents to solve their child-rearing problems if they have strong negative images of themselves going back when they were very young, including when they were in their mothers' womb, and lack the strength to look straight at and solve the problems they face. For children's soul to develop, it is important

give them experience receiving ample amount of love during their fetal life and infancy. However, the love they get from their parents must be unconditional love. To provide a safe and secured environment for their children to grow in, mothers must be able to care for them with tender love. ²⁹⁾ Those mothers participating in this study for whom the essential needs of support method proved effective apparently all had traumatic experiences hidden in their subconsciousness.

In individual counseling cases, counseling provided is designed to meet the needs of the individual client, but since this study targeted groups rather than individuals, the intervention could not be customized to meet the needs of individual participants. Using the essential needs of soul support method, together with the personalized SAT-based therapy support, was deemed effective in addressing the shortcomings of applying the essential needs of soul support method to groups.

V. Conclusions

1. After the intervention, the essential needs of soul support method used to provide guidance for child-rearing mothers proved effective in significantly raising their self-esteem level, support awareness level and child-care confidence level, and significantly lowering their depression level, cortisol level of the saliva and subjective stress level.

2. Three months after the intervention, the extended effects were favorable behavioral modifications towards one's children and towards oneself, higher levels of self-esteem and child-care confidence, and a lower depression level.

3. The essential needs of soul support method using positive image-scripts based on quantitative and qualitative data analyses is believed to be effective in reducing stress borne by child-rearing mothers and improving their confidence in caring for their children.

Acknowledgement

This study was conducted as a category B basic research of the Ministry of Education, Culture, Sports, Science and Technology's Grant-Aid for Scientific Research (Proposal No. 16300219; title: "A Study of a Long-Distance Support System for Sustained Health Behavior Using a Counseling Method for Supporting Prevention of Lifestyle Diseases among Local Residents, Patients and Patients-to-Be," Research Leader: Sayuri Hashimoto. We would like to express our sincere gratitude to all who cooperated in this study.

Notes and References

- 1) "Kodomo no Karada to Kokoro," *Renraku Kaigi Hen: Kodomo no Karada to Kokoro Hakusho 2005*, Tokyo, 95-97 (2005)
- 2) Sakama, I., Yamazaki, K., Kawata, C., "Ikuji Sutoresu no Kitei Yoin ni kansuru Kenkyu," *Nihon Koshueise-shi*, 46 (4), 250-261 (1999)
- 3) Shimizu, K., Nishida, K., "Ikuji Sutoresu Kozo no Kenkyu," *Nihon Kaigo Kenkyuu Gakkai Zasshi*, 23 (5), 55-67 (2000)
- 4) Hattori, Y., Kanekawa, K., Harada, M., "Nyuyoji no Shinshin Hattatsu to Kankyo – Osaka Repoto to Seishin Igaku-teki Shiten –," *Nagoya Daigaku Shuppankai*, Nagoya, 14-22 (2003)

- 5) Tsuzuki, C., Kanewaka, K., "Sango Ikkagetsu-go no Hahaoya ni taisuru Kangoshoku ni yoru Kateihomon no Koka – Hahaoya no Fuan to Ikuji ni taisuru Toraekata ni Shoten o Atete –," *Nihon Koshueisei-shi*, 49 (11), 1142-1151 (2002)
- 6) Yamamoto, J., Takabayashi, A., Iida, K., "Hahaoya Gakkyu he no Shonika-i no Kainyu to sono Koka no Kento," *Shonihoken Kenkyu*, 58 (3), 423-427 (1999)
- 7) Kuwata, S., "Ikuji Koza ni okeru Hahaoya he no Sosyaru Gurupu Waku (I)," *Undo, Health Kyoiku Kenkyu*, 7 (2), 41-45 (1998)
- 8) Munakata, T., *Sutoresu Kaisho-gaku, Shogakkan Raiburari*, Tokyo, (1995)
- 9) Munakata, T., *SAT Ryoho*, Kaneko Shobo, Tokyo, 32-71 (2006)
- 10) Higuhi, T., "Sutoresu to Horumon," *Nihon Hikaku Naibupitsu Gakkai Hen*, "Karada no naka kara Sutoresu o Miru," Gakkai Shuppan Senta, Tokyo, 71-91 (2000)
- 11) Morimoto, K., "Sutoresu Kiki no Yobo Igaku," *NHK Bukkusu*, Tokyo, 141-144 (1997)
- 12) Sakai, H., Sato, E., Koike, K., Shonozaki, T., Mizuochi, F., Goto, M., "Daeki de Sutoresu o Hakaru Kokoromi," *Nihon Daigaku Shigaku-bu Kenkyu Kijo*, 26, 57-61(1998)
- 13) Abe, K., Abe, A., Honma, K., Watanabe, Y., "Daeki Koruchizoru no Hendo o Shihyo to shihta Sutoresu Hyoka to sono Oyo – Shogai no aru Hitobito no Supotsu Katsudo o Rei ni -," *Kansei Fukushi Kenkyujo Nempo*, 3, 75-79 (2002)
- 14) Higuchi, K., "Daeki-chu Koruchizoru Sokutei ni yoru Sutoresu no Hantei," *Rongi*, Adkita Keizai Hoka Daigaku Tanki Daigaku-bu, 68, 85-89 (2001)
- 15) Marilyn, J. E., Marjorie, H. K., Eunsuk, C., et al., "Maternal Stress Beginning in Infancy May Sensitize

- Children to Later Stress Exposure: Effects on Cortisol and Behavior," *Society of Biological Psychiatry*,
52, 776-784 (2002)
- 16) Munakata, T., ed., *Kaunsering Iryo to Kenko*, Kaneko Shobo, Tokyo, 29-194 (2004)
- 17) Kawai, N., Shoji, J., Chika, Y., Kato, H., Nakano, E., Tsuneji, K., "Ikuji Fuan ni kansuru Kisoteki Kento,"
Nihon Sogo Ai-iku Kenkyu Kijo, 30, 27-39 (1994)
- 18) Mizuguchi, K., Shimonaka, J., Nakazato, K., *Nihongo-ban STAI Shijo Tebiki*, Sankyo Shobo,
- 19) Fukuda, K., Kobayashi, S., *Nihongo-ban STAI Shijo Tebiki*, Sankyo Shobo,
- 20) Munakata, T., *Jinsei o Risetto Shitai Anata ni*, Mimatsu Co., Ltd., Tokyo, (200)
- 21) Munakata, T., e., *Herusu Kansuringu Jiten*, Nagoya, 368-381 (1999)
- 22) Saito, E., "Boshi Rinsho no Tachiba kara, Kokoro," *Kokoro no Kagaku*, 103, Nihon Hyoronsha, Tokyo,
36-43 (2002)
- 23) Watanabe, H., *Boshi Rinsho to Sedaikan Dentatsu* Kongo Shuppan, Tokyo, (2000)
- 24) Hashimoto, S., Nakano, T., "Ryoshin Imoji ga Jiko Imoji, ni kansuru Eikyo ni kansuru Chosa Kenkyu,"
Nihon Hoken Iryo Kodo Kagaku-kai, Nempo, 19, 121-138 (2004)
- 25) Higuchi, R., Munakata, T., Hashimoto, S., ISAT Ryoho ni yoru Shin-in Shikaku Shogai no Chiryō Yogo
ni kansuru Kenkyu," *Journal of Health Counseling*, 9, 45-54 (2003)
- 26) Maslow, A. H., (translation by Koguchi, T.), *Ningensei no Shinrigaku*, Noritsu Daigaku Shuppan-bu,
(1998)
- 27) Rogers C. R., (translation supervised by Ito, H. and Murayama, M.), *Rojyasu Senshu*(vol. 1) (vol. 2) ,
Yomu Shobo, (2001)

- 28) Munakata, T., *Kdomotachi wa Seicho Shitagatteiru*/Koeisha, Tokyo, 182 (1998)
- 29) Hashimoto, Sa., "Kokoro (Seishin) no Hattatsu," Tanaka, H., ed., *Nyuyojiki no Kenko*, Nishinohon Hoki Shuppan, Okayama, 23-46 (2004)
- 30) Horiuchi, K., Hashimoto, Y., Iida, Y., *Kangaru Nukumori no Kosodate*, Medika Shuppan, Tokyo, (1999)
- 31) Munakata, T., *SAT Kanunseringu Giho*, Koeisha, Tokyo, (1997)

Examining Effects of Human Relation Skill Using Genetic Temperament Concept on Stress
Management: 3-month-followup Intervention

Kyoko Tanaka and Tsunetsugu Munakata

Department of Human Care

Graduate School of Comprehensive Human Sciences, University of Tsukuba, Tsukuba

Correspondence: Tsunetsugu Munakata

D511 1-1-1 Tennoudai, Tsukuba, Japan 305-8577 munakata@hcs.tsukuba.ac.jp

Abstract

The purpose of this study was to conduct an intervention of human relation skill training using genetic temperament concept and to examine its effectiveness as a method for managing stress caused by human relations. The subjects were divided into two groups. One was the intervened group comprising 20 subjects selected by snowball sampling, who agreed to participate in the study. The other was the non-intervened group comprising 19 subjects matched respectively with those in the intervened group.

To the intervened group we conducted the one-off individual intervention centered on human relation skill using genetic temperament concept for about two hours. Then, one month and three months after the intervention, the self-administered questionnaire surveys were carried out by mail on the matters including changes in human relations and stress caused by such human relations. Also to the non-intervened group the surveys were carried out in the same manner by mail one month and three months after the first survey. When analyzing the collected data, subjects were restricted to only female members (intervened group: n=13, non-intervened group: n=15). The result of the analysis revealed significant changes toward the decline in subjective stress, and improvement in the score of human relation among those in the intervened group. It

suggested, therefore, that the intervention using genetic temperament concept was effective as a technique for human stress management.

Keywords. Genetic temperament concept; human relation skill; temperament coaching; stress management.

1. Introduction

Nearly a half of all Japanese lived in Japan are reportedly under constant stresses and strains in recent years¹⁾²⁾. According to the Comprehensive Survey on Living Conditions of People on Health and Welfare 2004³⁾, among the causes of stresses and strains, the largest regardless of gender was one's own health condition which occupied 32.1% of the total multiple answers. This was followed by future income in one's old age, which occupied 28.1%. Human relations with own family and with non-own family occupied 13.2% and 17.7%, respectively. It means that the human relations with family and non-family combined are one of the major causes of stresses, occupying 30.9%. Many earlier studies also reported that a person's stress and health were much affected by the relations with people close to one⁴⁾⁵⁾⁶⁾. Support to human relations could be said to be an effective means for managing stresses.

Human relations are considered to be a system to fulfill mutual expectations, and the relationship is affected by how to understand the heterogeneity of the other persons. As H. H. Kelley and J. W. Thibaut⁷⁾ stated people on mutual interdependence are keenly interested in explaining each other's behavior. Each of them wishes to know what the counterpart really likes because he/she wants to know what he/she can expect from his/her counterpart in future and how he/she can change his/her partner's behavior. The question is if the personality of the counterpart is forecastable or not, because the most important social interaction arises if the

relationship is to be broadened in to the future⁷⁾. In other words, obtaining the information to forecast the taste and behavior of the counterpart will be an effective means for adjusting the human relations.

It is said that man based on his/her own perception, understands the object persons, estimates their future behavior and decides how to contact with them⁸⁾. If so, the support to tighten the control of personal emotion, which affects the personal perception, and also enhances the ability to forecast is considered most important for the man to become acclimatized to a social environment. We believe it is an important task in modern stressful society to accommodate self-care support for the people not to depend solely on the support from the specialists but to independently enhance their own stress management ability⁹⁾.

When we look at our human relations in everyday life, we often taste the bitterness of dissatisfaction, anxiety and sorrow because the object persons in most cases behave against our expectations. According to our knowledge of recent behavioral genetics, however, man's behavioral traits in many cases look to be genetically regulated and thus there is an irrational aspect to our expectations to others as suggested by Cloninger¹⁰⁾ and Gray¹¹⁾. Kijima, applying Cloninger's theory, stated that "the biological factor of behavioral traits might be applicable also to 'Person-Person fit' to which we often refer when we consider compatibility of temperament among people"¹²⁾.

Munakata advocates his original temperament coaching based on the knowledge obtained from his accumulated clinical studies¹³⁾. He built up the theory that one can improve human relationship not by expecting what seem unexpected due to genetic factors on the counterpart but by rationally expecting only what seems expectable, and he has actually achieved a measure of success in relieving stress caused by human relationship. It has not yet been proved, however, if his temperament coaching is effective for the long-term

sustainability of stable human relationship. To the best of our knowledge no other studies on the measures to improve stress caused by human relations similar to his have been reported worldwide. As the result of our search by PubMed as of July 2008, we hit 259 study reports and articles in overseas for the past 5 years with 'interpersonal stress management' as the key words, while 142 with 'human relation skill', 4 with 'human relation skill' and 'stress management' combined, and 12 with 'human relation skill' together with 'intervention'. In those reports and articles, however, the objects of the studies are victims of DV and mentally handicapped persons. We found no such reports that referred to the methods and practices of stress management of human relations for ordinary people and the studies on interventions to them.

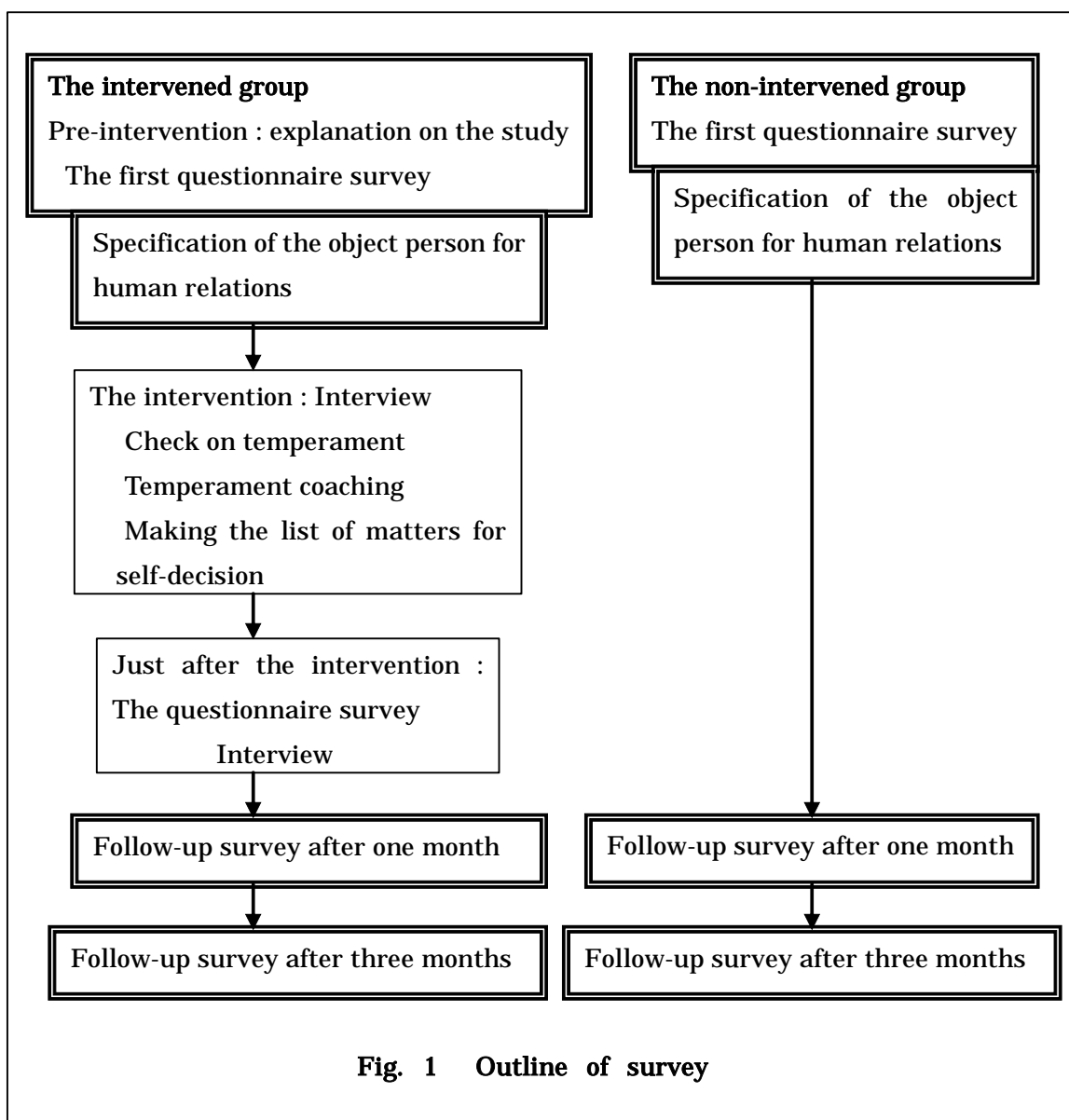
The present study is intended as an intervention based on the theory of temperament coaching for the management of stress caused by human relations to examine the follow-up survey after one month and three months, respectively, and to examine the effectiveness of stress management by this temperament coaching.

2. Method

1) Method of Survey

The prospective cohort study was adopted. Those who agreed to participate in the study were divided into two groups, namely, the intervened group and the non-intervened group. The former consists of 20 persons (2 men, 18 women, average age 37.8 ± 10.6) selected by snowball sampling. Next we requested individuals who were matched in age and sex with members of the former groups (and consented to cooperate in the study) as members of the non-intervened group. This non-intervened group consists of 19 persons (3 men, 16 women, average age 37.7 ± 12.1). At the starting point of the study everyone in both groups specified one

object person each as the counterpart from among his/her familiar acquaintances. The necessary conditions for the specification were that the object person must be familiar to him/her; he/she had contacts with the object person at least once a week; he/she intended to continue the relationship with the object person; and there is a motivation for he/she to improve or restore the relationship with the object person. The signed self-entry questionnaire surveys were sent to the intervened group by mail on matters that included changes in the relationship with the specified object person and subjective stress scale caused by such human relationship just before the intervention and then one month and three months each after the first survey. Also with each individual in the intervened group additionally semi-structured interview on his/her human relations was held before and just after the intervention. To the members of the non-intervened group, the same surveys at the same timing with those for the intervened group were also conducted. Outline of the proceedings of the survey for both groups is comparatively shown in Figure 1.



We were able to collect data from 15 participants in the intervened group (2 men and 13 women) four times, first before the intervention, second just after the intervention, third 1 month after the intervention and finally 3 months after the intervention. As to the non-intervened group, we were able to collect from all the 18 participants (3 men and 15 women) all the survey sheets. Both collection rates and valid response rates were 75% for the intervened group and 95% for the non-intervened group.

2) Method of intervention

The interventions, in the form of one-off interview with each participant in the intervened group for about two hours each, which centered on the temperament coaching to support understanding Munakata's genetic temperament concept were conducted between March and June 2006 by the author of this report who had received training on temperament coaching. The genetic temperament theory, individually constructed by T. Munakata, is the one to grasp personality/temperament as the hallmark of sensitivity and reaction against stimuli from outside based on the fruit of recent studies on temperament in the field of behavioral genetics. Personality/temperament is classified into three types as reported by Kretschmer, namely, cyclothemic, epileptic and autistic. To define the strength of sensitivity and reaction of personality/temperament, added thereto are immodithymia advocated by K. Shimoda, and novelty seeking temperament and harm avoidance temperament by Cloninger. Munakata, in explaining the temperament coaching, makes the points of self-treatment and treatment for others by type of temperament to effectively meet the traits of each genetic temperament and the requirement of each temperament. The temperament coaching trait of each temperament is grasped not only as attitude and behavioral trait but also as something to urge understanding of other factors including biological ones. Therefore, we urged all the participants in the intervened group to rationally adjust their expectations from their respective human relations object persons through ascertaining the genetic temperament of their own and of the said object persons with the information obtained from the temperament coaching and also through understanding the differences of genetic emotional reactions. In other words, we urged them to realize the fact that it depended on the object person's temperament if there was anything they could expect or not in the human relations and also to set up the behavioral targets in the human relations with the said object person so

that they might enhance the reliability of their prospect on fulfilling their own needs. As to the details of the expectations by type of temperament, please refer to the other literature¹⁷⁾.

3) Intervention

In the interventions by temperament coaching, we first explained that the human relationship with those closer to them was regarded as a system to fulfill mutual expectations and therefore that such relationship might be affected by how to grasp the heterogeneity of the object person. And then, to presume the type of temperament applicable to those of the cooperators themselves and of their respectively specified object persons, the self-check list was made to identify genetic temperament. As the scales had not yet been standardized then, we regarded the type of temperament applicable to the cooperators themselves and their specified object persons as the clue to our judgment, we left the final specification of the applicable type of temperament to each cooperator's own judgment, with our supplementary explanations on temperament when necessary. The trait of human emotional reaction depends very much on individual genetic temperament. Our human relations will be aggravated and our stress will be intensified if we, lacking in understanding of the heterogeneity and judging the conduct of the object person only to be corrected, keep our unilateral expectation. We, having paid our attention to the above consideration, urged them to set the targets of necessary actions including to make a distinction between what can be expected from the object person and what cannot be expected for improving the relations or reducing the stress on the basis of mutual heterogeneous temperaments. Finally they made a list of what must be done by themselves.

4) Consideration of ethical aspect

We explained to both intervened and non-intervened groups in writing and orally what the study was designed to achieve, received the agreement in writing from all the collaborators, and then conducted the survey. To those in the non-intervened group who requested us to disclose the results of the survey including the list of genetic temperaments for self-checking completed in the first survey, we sent private letter to each of them describing the measures for self-treatment by type of temperament and our advice on human relations and enclosing therewith printed material on genetic temperament concept utilized in the temperament coaching.

5) Composition of questionnaire survey sheet

The questionnaire survey sheet was composed as shown below:

Attributes of the study cooperator: full name, age, sex, occupation and mail address

Attributes of the object person of human relationship: age, sex, occupation, and relationship

Scale of human relations: A new scale was produced solely for this study with partial amendment and supplementation to the scale of human relations developed by Munakata. Each cooperator was requested to show the current relations with the object person specified by the very cooperator putting a circle on the line. Seven alternatives were given such as "I want to be with the object person all the time", "It makes me happy to talk with the object person", "I am glad to see the object person", "It makes no difference in either way," "I want to look away from his/her face when I see the object person", "It makes me unpleasant to talk with the object person" and "I want the object person to clear out of my sight". A score from 6 to 0 was given to each alternative. The higher the score, the better

the human relations with the object person.

According to our instruction, the cooperator specified the object as the counterpart of the human relations under the following conditions: (1) The specified object person must be one of the other persons very much closer to the cooperator including his/her family members. (2) The cooperator has contact with the specified object person at least once a week. (3) The cooperator has an intention to continue the relationship with the specified object person. (4) The cooperator has a motivation to improve or restore the relationship with the specified object person. The above requirements were accepted and we were able to measure the scale.

Subjective stress scale: We asked every cooperator to show the scale of their subjective stress caused by the human relations with specified object person on a straight line of between 0% and 100%, in which 0% represented non-stressful state.

Self-esteem scale: We adopted the concept advocated by M. Rosenberg, 1965 (tr. T. Munakata, 1987)²⁰⁾²¹⁾. Positive self-evaluation is measured by responses to the 10-item questionnaire. Each item had three-response choices. The higher the score between 0 and 10, the better self-image the respondent had.

The list of self-check on genetic temperament: The list contains the scales to measure the degree of intensity of six types of temperament such as cyclothymia, epileptoid, autistic temperament, immodithymia, anxiety temperament and novelty seeking temperament, which were based on Munakata's genetic temperament concept and were developed through our clinical experiences.

Total 30 questions were prepared with 5 per type of temperament^{22) 23)}.

Questions on human relations and temperament concept requiring free descriptive answer: To grasp the changes in the relations with the specified object, responses were obtained in free description under the heads including 'your current relations with the specified object', 'your attitude toward the specified object' and 'the changes in your own behavior'. Other heads on understanding the concept of temperature and its application were added for the non-intervened group and also responses were obtained from them in free description formula.

3. Analysis

In the obtained data the ratio of men to women was unbalanced for each group; 2 men and 13 women for the intervened group while 3 men and 15 women for the non-intervened group. According to some earlier studies^{24) 25)}, the interactive effects by differences between the sexes should be taken into consideration, but it gets too much complicated to analyze them. Thus in this study we limited the object of the analysis only to women (13 women with average age of 36.2 ± 12.02 for the intervened group, while 15 women with average age of 39.1 ± 11.47 for the non-intervened group).

To analyze the obtained data we used the SPSS version 11.0 for Windows. Wilcoxon Signed-Rank Test was conducted for comparing the data from the first and second surveys of the intervened group. Also to evaluate the sustainability of effects of intervention at each three points of time, the first survey, one month and three months each after the intervention, we conducted the Friedman test for each group. In addition to the above, for multiple comparison we used the comparative diagram of object figures and examined the scale scores at each three surveys using Wilcoxon Signed-Rank Test with corrected p-value. Also, to compare the

intervened group with non-intervened group at each three points of time, we adopted the Mann-Whitney U test.

4. Results

1) Changes in the scale scores for each group

After the interventions conducted with the temperament coaching, we compared the scale scores of the intervened group between the two points of time; the first survey and just after the intervention. As a result, the subjective stress scale showed significant declines ($p=.004$) and the human relations scale scores showed significant increases ($p=.011$), Table 1.

Table 1 Comparison of scale scores at the pre-intervention point and those just after the intervention

	at the point of pre-intervention Me(Q)	just after the intervention Me(Q)	p-value
degree of subjective stress	70 (22.5)	50 (13.8)	.004
Human relations scale scores	3.0 (0.9)	4.0 (1.0)	.011

Wilcoxon signed-rank test (n = 13)

Subjective stress scale scores for the intervened group showed significant differences in both comparisons; between pre-intervention and one month after ($p=.036$), and also between pre-intervention and three months after ($p=.036$) (Fig. 2).

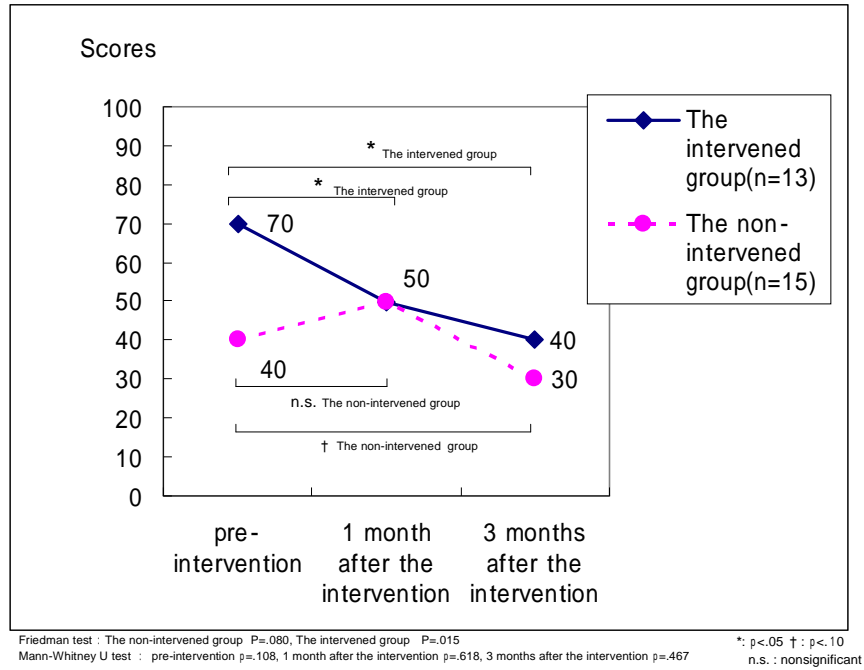


Fig. 2 Changes in the degree of subjective stress

Human relations scale scores for the intervened group showed just a limited upward tendency in the comparison between pre-intervention and one month after ($p=.052$), but the comparison between pre-intervention and three months after showed a significant rise ($p=.0014$) (Fig. 3).

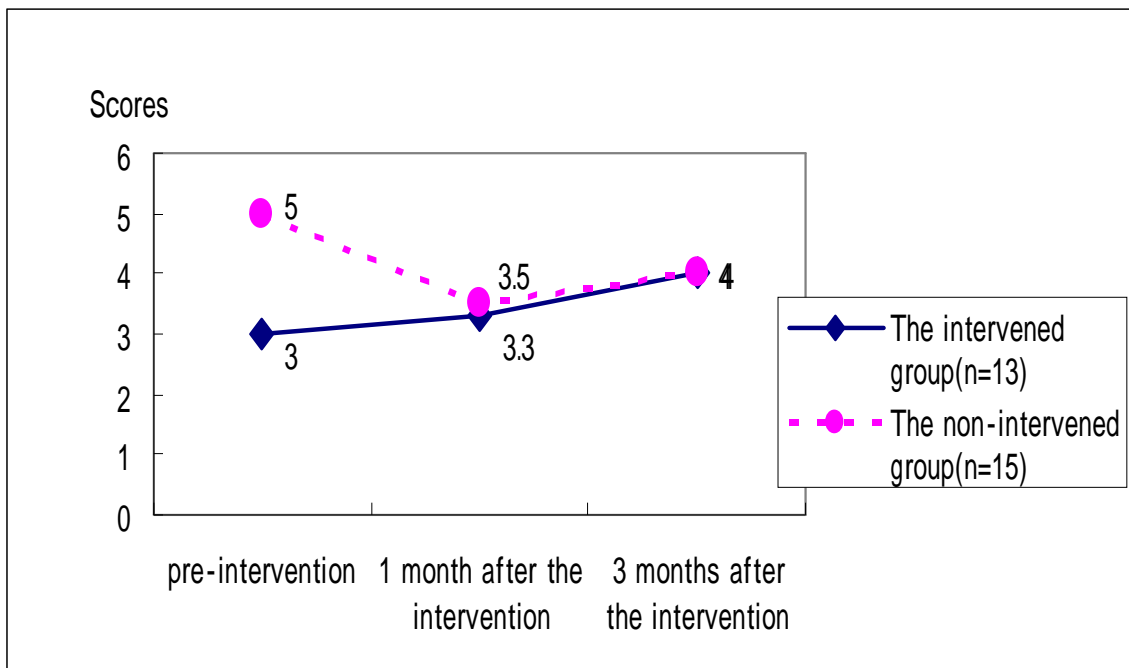
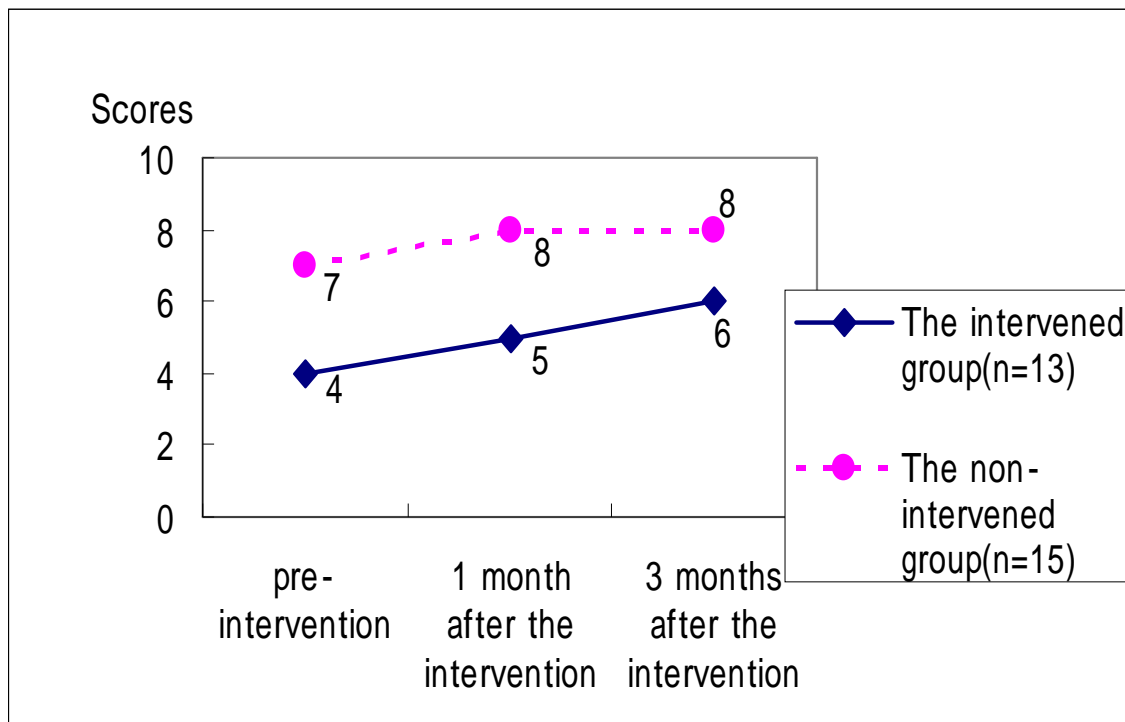


Fig. 3 Changes in human relations scale scores

While self-esteem scale scores for the intervened group showed a significant result in the Friedman Test, there was little noticeable difference in the comparisons neither between pre-intervention and one month after nor between pre-intervention and three months after (Fig. 4).



Mann-Whitney U test: pre-intervention $p = .001$, 1 month after the intervention $p = .002$, 3 months after the intervention $p = .003$

Fig. 4 Changes in self-esteem scale scores

As to the non-intervened group, the subjective stress scale scores showed no significant difference in the comparison between the point of first survey and one month after, and just a limited declining tendency in the comparison between the point of first survey and three months thereafter ($p = .060$). Scores of both human relations scale and self-esteem scale revealed significant differences in the comparisons neither between the first survey and one month thereafter nor between the first survey and three months thereafter (Figs. 2, 3, and

4).

2) Comparisons of scale scores among each point of time between the intervened group and the non-intervened group

At the first survey, the comparisons of subjective stress scale scores between the intervened group and the non-intervened group showed no significant differences, but human relations scale scores for the non-intervened group was significantly higher than those for the non-intervened group ($p=.041$). At each point of one month and three months after the first survey, no significant difference was shown between the two groups (Fig. 3). On the other hand, the comparisons of self-esteem scale scores showed significantly lower result in the intervened group than in the non-intervened group at every three points of time (before the intervention : $p=.001$, one month after intervention : $p=.002$, and three months after intervention: $p=.003$) (Fig. 4).

3) Major types of temperament of the cooperators in the intervened group and their human relations object persons

Shown in the Table 2 are the major types of temperament, which the cooperators of the study judged applicable to those of their own and of their object persons through the course of the intervention using temperament coaching. It was revealed that according to the cooperators' recognition the other persons that they specified as their object persons with whom they felt motivated for improving or restoring human relations had different types of temperament from their own.

Table 2

Major types of temperament of survey cooperators in the intervened group and of those who were selected as object persons for human relations

No.	Major types of temperament of survey cooperators in the intervened group	Sex	major types of temperament of human relations object person
1	Immodithymic temperament Anxious temperament	male	Cyclothemic temperament
2	Cyclothemic temperament Novelty seeking temperament	female	Autistic temperament
3	Cyclothemic temperament Anxious temperament	female	Immodithymic temperament
4	Immodithymic temperament Anxious temperament	female	Autistic temperament
5	Autistic temperament	female	Cyclothemic temperament Immodithymic temperament
6	Autistic temperament Anxious temperament	female	Anxious temperament
7	Anxious temperament Immodithymic temperament Autistic temperament Cyclothemic temperament	female	Epileptic temperament Immodithymic temperament Anxious temperament
8	Immodithymic temperament Autistic temperament	male	Cyclothemic temperament Anxious temperament
9	Cyclothemic temperament Immodithymic temperament Anxious temperament	female	Immodithymic temperament
10	Autistic temperament Anxious temperament	male	Noveltyseeking temperament Cyclothemic temperament

Immodithymic temperament			
11	Autistic temperament	female	Cyclothemic temperament
12	Cyclothemic temperament	male	Epileptic temperament
	Novelty seeking temperament		Novelty seeking temperament
13	Autistic temperament	female	Cyclothemic temperament
	Anxious temperament		Novelty seeking temperament

5. Discussion

According to Munakata's stress function model, cognitive stress management means, under the circumstances in which things in life do not go as one wants them to, to clarify one's own demand, to deepen the self-confidence with predictability for fulfilling it and then to obtain the support from others. In our study, the effectiveness of the intervention as a technique for managing the stress caused by human relations was appraised from the following three operative viewpoints; 'stress cognition', 'human relationship cognition' and 'self cognition'. We examined how the three variables of demand, predictability and support in the stress function model were controlled watching the changes in each scale scores.

1) Effects on stress cognition

Subjective stress of the intervened group showed a significant decline from the point of pre-intervention to that just after the intervention. It also showed a significant decline both at the point of one month and three months after the intervention from the point of pre-intervention. On the other hand, subjective stress scale scores of the non-intervened group showed no significant changes at any three points of time of the first survey, one

month and three months each thereafter. Thus observed was the effect of intervention to relieve subjective stress in the intervened group.

Judging from the fact that, by the one-off intervention using the temperament coaching, subjective stress showed a significant decline with its continuous effect for three months thereafter, it is believed that the cooperators promoted in the first place their understanding on the temperament of their human relations object persons, and then progressively enhanced their predictability concerning other persons' attitude and behavior necessary to adjust their human relations. In addition, we assumed that the cooperators were given an opportunity to reconsider how to behave and cope with others on the understanding of temperament of their own and their object persons, which had been obtained from drawing up the list of matters to be decided by themselves as a behavioral target after the intervention, and also that they were able to promote the fulfillment of demands by way of switching their one-sided expectations and demands of the others over to those of practicable nature. We heard from many of the cooperators in the intervened group that the temperament coaching seemed well applicable also to the human relations with those other than the object persons. Actually we confirmed the effects of promoted supportive recognition in some cases.

As shown in Table 2, it became clear that the types of temperament of human relations object persons specified by the intervened group were recognized different from those of the cooperators' own judgment. However, it is difficult to verify if the temperament of the object persons was actually matched with the cooperators' own judgment. On the other hand, it seems also true that one is apt to understand the others, predict their future

behavior and decide how to cope with them based on their own cognition on them²⁷. Thus, it seems more probable that the human relationship is affected more by observer's own subjective viewpoint than the object's real person. Accordingly, the scale of subjective stress caused by human relations is also expectedly affected by how to recognize the other heterogeneous person, and it is believed that to look at themselves and the others objectively from the viewpoint of genetic temperament concept obtained through the intervention effectively helped them establish the basis to accept heterogeneity of the other persons.

2) Effects on human relations cognition

As a result of adjustment, the human relations scale scores at the point just after the intervention showed a significant improvement from the point of pre-intervention. The human relations scale scores at the point of one month after the intervention showed a somewhat improving tendency from the point of pre-intervention. Also, the human relations scale scores at the point of three months after the intervention showed a significant improvement from the point of pre-intervention. Thus the effects of the intervention were quite obvious. In case of the non-intervened group, however, significant changes were not confirmed at any three points of time, one month and three months after the first survey.

Cognition on personal relationship, the perception of the other persons, is said to have different feature from that of matters²⁸. In the cognition on personal relationship, judgment leads to not only sensory information directly stimulated by the present objects but also a lot of various information covering a wide area in terms of time and space such as other person's past behavior, rumors circulated by outsiders and even internal characteristic and

psychological process of the person who is not necessarily responsive to external stimuli. In such a process as above, the content of recognition depends much upon subjective factors of the very cognitive person. Although the object person's attitude and behavior remain unchanged, their meaning may change with availability of different type of recognition on human relations through understanding the temperature concept.

The human relation scale score does not express objective relationship but subjective personal feelings towards object persons. Feeling is the fundamental factor for making the attitude as it has been indicated since way back that by changing a feeling, a factor for making the attitude, the cognition, another factor, is to be changed²⁹. Also, according to Munakata³⁰, feeling is defined as "an indicator of one's appreciation for the predictability and the result of his/her demand for being fulfilled or not." From the knowledge as introduced above, the human relation scale scores may be considered to express the degree of one's expectations and demands to the object person and of their fulfillment as well. When one's high expectation to the object person is fulfilled, one finds satisfaction and holds the cognition of favorable relations. When one's expectation to the object person, though being so high, is not fulfilled, one harbors dissatisfaction and hatred and holds the cognition of worsened relations. Human relations scale scores in the intervened group at the point three months after the intervention were significantly improved compared with that of pre-intervention. This observation led us to the understanding that the attainment of the plan to make personal feelings controllable through changes in the degree of fulfilling the demands was a factor in the improvement of cognition on personal relations. There was a question requiring a written answer, "what does it mean for you personally to know the concept of temperament?" in the survey conducted three months after the intervention. The followings are

some major examples of descriptive answers obtained from the intervened group; "I think it enables me to review myself. By so doing I think I can aim at better communication with the people who have something to do with myself." "It is related to knowing the feeling and essential personality of the object person." "It was believed necessary to know the object person and myself. "If I had not known the concept of temperament, I wouldn't have come in contact with those who I had difficulty to understand each other from the very beginning." From these answers it was assumed that raising the motivation to improve the relationship through cultivating a better understanding on oneself and the object person was a reason for the personal relations to be improved.

3) Effects on self cognition

Self-esteem scale score showed a significant result by Friedman test but showed a significant difference in the comparisons neither between pre-intervention point and the point after one month nor between pre-intervention point and the point after three months. Small number of participants in the intervened group is considered to have affected such consequences. So reexamination seems necessary with the increased number of data.

There are lots of factors that may influence the self-recognition. The image of past memory in particular controls the present self-image and the behavior as an output³¹). There is a possibility therefore, that the effect of one-off intervention by temperament coaching, which exerts influence upon present recognition, had a difficulty to remarkably improve the self-image although it makes a contribution to the adjustment of environment focused on human relations. It is believed to be meaningful for positive self-recognition to have a prospect for fulfilling the demand single-handed with the aid of the temperament coaching by adjusting own expectations in

accordance with the object person's temperament whatever it may be.

As a result, the self-esteem of the intervened group was lower than that of the non-intervened group at every three points of the first survey, one month and three months thereafter. It was possibly caused by the difference of collective trait between the two groups, but it is hard to examine it at present. According to Hashimoto et al³²), by changing the image of important other persons including the parents from negative one to positive, the root feelings connected to the present problem such as fear and danger are relieved, which leads to the positive change in self-image. We have a fair idea that the intervened group, having from the outset sensed intensely negative personal feeling against closely related other persons, had fewer chances to change self-esteem to the positive one than the non-intervened group and that it was one of the reasons for the lower self-esteem of the intervened group.

6. Conclusion

In this study we conducted an intervention using temperament coaching for the management of stress caused by human relations and examined its effectiveness one month and three months each thereafter. The subjective stress in human relations declined and the scores of human relations scale continuously improved. In other words, the intervention demonstrated its effectiveness for the management of stress caused by human relations changing the subject's own recognition of the human relations to positive one. Thus, the intervention using temperament coaching suggested certain effectiveness as a technique for managing stress caused by human relations.

We believe it quite meaningful for setting up a supporting system to cope with stress by individual self-care that an intervention working upon cognition brought about good results. Future study seems required to further enhance the effects of the intervention as a realistic and concrete technique for managing stress caused by human relations, which may meet simultaneously both the requirements to reduce stress connected with human relations, and to make the most of human relations as a resource needed for coping with a lot of stress.

7. Limitations of the study

On dividing the cooperators with this study we first selected the subjects for the intervened group and then we selected the subjects for the non-intervened group who were matched respectively with those of the intervened group in terms of age and sex by individually requesting for their cooperation. Accordingly, there was most probably a bias against the degree of their interests in the study and of their motivation to improve the relationship with the object persons between the two groups. As to the way to set up the intervened group and the non-intervened group, therefore, it should be noted as a future task to figure out proper random sampling in view of homogeneity between the groups.

References

- 1) Statistics and Information Department, Minister's Secretariat, the Ministry of Health, Welfare and Labour .

Outlook of the Survey on the Trend of Health and Welfare 2000, 1-4 (2001)

2) Statistics and Information Department, Minister's Secretariat, the Ministry of Health, Welfare and Labour :

Outlook of the Comprehensive Survey on Living Conditions of the People on Health and Welfare 2004,

-6 (2005)

3) Statistics and Information Department, Minister's Secretariat, the Ministry of Health, Welfare and Labour :

Outlook of the Comprehensive Survey on Living Conditions of the People on Health and Welfare 2004,

-6 (2005)

4) Mori, K. : Investigative Study on the Effect of Social Support – Based on the Analysis of Unrestrictive

Description by the Teachers in Public elementary and Middle Schools : *Bulletin*, Faculty of Human Life

Sciences, Showa Women's University, Vol. 14, pp. 77-89 (2005)

5) Munakata, T. : Self-Care and Social Support Network : *The Japanese Journal of Health Behavioral Science,*

4, 1-20 (1989)

6) Cohen S. and Mckay G. : Social support, stress and the buffering hypothesis: An empirical review and

theoretical analysis. In A. Baum, J. Singer & S. Taylor (Eds.), *Hand-book of psychology and health*. 4

Erlbaum , 253-267 (1984)

7) Kelley, H. H. & Thibaut, J. W. (Translated by Kurokawa, M.): *Interpersonal Relations: A Theory of*

Interdependence: Seishin-Shobou, Tokyo, 228 (1995)

8) Hayashi, F. (Edited by Nakajima, Y., Ando, K., Koyasu, M., Sakano, Y., Shigemasu, K., Tachibana, M., &

Hakoda, Y.): *Dictionary of Psychology*. Yuhikaku, Tokyo, 549 (1999)

9) Yamanaka, H. : *The Idea & the Role of Stress Management Science*: L'esprit d'aujourd'hui 469, Shibun-do,

25-33 (2006)

- 10) Cloninger, C. R. (Translated by Nakajima, T. & Nakamura, M.) : *A Psychological Model of Personality and Psychopathology*, 37(2), 91-102 (1997)
- 11) Gray, J.A. : *The psychophysiological basis of intro-version-extraversion. Behavioral Research and Therapy* , 8 , 249-266 (1970)
- 12) Kijima, N. : Foundations of Cloninger's Personality Theory : *Psychiatric Diagnostics*, 11(4), 393 (2000)
- 13) Munakata, T., Komori, M., Suzuki, K., Hashimoto, S. & Suzuki, K. (Supervised by Munakata, T.) : *Learning SAT Therapy*. Kaneko Shbo, Tokyo, 107-129 (2007)
- 14) Flick, U. (Translated by Oda, H., Yamamoto, N., Kasuga & T., Miyaji, H.) : *Qualitative Forschung von Ulwe Flick*: Shunjyusha, Tokyo, 72, 94-121 (2002)
- 15) Munakata, T., Komori, M., Suzuki, K., Hashimoto, S. & Suzuki, K. (Supervised by Munakata, T.) : *Learning SAT Therapy*. Kaneko Shbo, Tokyo, 107-129 (2007)
- 16) Munakata, T., Komori, M., Suzuki, K., Hashimoto, S. & Suzuki, K. (Supervised by Munakata, T.) : *Learning SAT Therapy*. Kaneko Shbo, Tokyo, 107-129 (2007)
- 17) Munakata, T., Komori, M., Suzuki, K., Hashimoto, S. & Suzuki, K. (Supervised by Munakata, T.) : *Learning SAT Therapy*. Kaneko Shbo, Tokyo, 128 (2007)
- 18) Munakata, T., Tanaka, K. & Kobayashi, Y. : Building Collaborative Human Relationship by Taking Advantage of SAT Temperament Coaching. *Journal of Health Counseling*, Vol. 13, 1-11 (2007)
- 19) Munakata, T. : *Health and Diseases Viewed from Behavioral Science– Updated Edition*, 1996, 212-215. Medical Friends Sha, Tokyo
- 20) Rosenberg M. : *Society and the adolescent self-image*, Princeton New Jersey, Princeton University Press,

1965

- 21) Munakata, T., Takatomi, T., Kawano, Y., Bell, D. & Bell, L.: Comparative Study on Home Environment and Mental Health of Both Japanese and US Youth : *The Ministry of Health and Welfare Scientific Research Report*(1987)
- 22) Tanaka, K.: Developing a Human Relations Management System Based on the Understanding of Temperament : A Collection of Master's Thesis, Master's Program in Health and Sport Science, University of Tsukuba, 29, 575-578 (2007)
- 23) Munakata, T., Tanaka, K. & Kobayashi, Y. : Building Collaborative Human Relationship by Taking Advantage of SAT Temperament Coaching : *Journal of Health Counseling*, Vol. 13, 1-11 (2007)
- 24) Hiraoka, A., Kobayashi, H., Arato, T. & Osuga, M. : Examining the Factors to Cause Changes in Biochemical Responses to Mental Stress (1) Sexual Difference : *Study of Biofeedback*, 22, 31 (1995)
- 25) Aida, K., Noguchi, S., Takashima, N., Uemura, Y., Takeuchi, M., Nakazoe, K., Sakae, R., Miyamoto, M. & Matsumura, K.: Study on Health Support to Middle- and Old-Aged Generations — Sexual Difference in Stress and How to Cope with Stress: *Study of Health and Welfare in Global Environment*, 7(1), 21 (2004)
- 26) Munakata, T. : *Survive Stress*: Shogakukan, Tokyo, 244-282 (1991)
- 27) Hayashi, F. (Edited by Nakajima, Y., Ando, K., Koyasu, M., Sakano, Y., Shigemasu, K., Tachibana, M., & Hakoda, Y.) : *Dictionary of Psychology*: Yuhikaku, Tokyo, 549 (1999)
- 28) Hayashi, F. (Edited by Nakajima, Y., Ando, K., Koyasu, M., Sakano, Y., Shigemasu, K., Tachibana, M., & Hakoda, Y.): *Dictionary of Psychology*: Yuhikaku, Tokyo, 549 (1999)
- 29) Rosenberg M.: Cognitive reorganization in response to the hypnotic attributional affect , *Journal of*

Personality, 28, 39-63 (1960)

30) Munakata, T. : *SAT Counseling Technique*, Koueisha, Tokyo, 45 (1997)

31) Munakata, T. : *SAT Therapy*, Kaneko Shobo, Tokyo, (2006)

32) Hashimoto, S., Isaka, M. & Higuchi, N. : A Study of the Influence of One's Image of their Parents Gives the

Self-Image and Mental health of Junior High School Students, *Journal of Health Counseling*, 11, 31-40

(2005)

Shift in Frequency of Voice Accompanied with Emotional Change in a Cancer Patient

Kei-Ichiro Kobayashi* and Tsunetsugu Munakata**

(SAT Therapy Project, University of Tsukuba)

“Vivid Life” Counseling Room, Tokyo*

Department of Human Care Science, University of Tsukuba, Tsukuba**

Correspondence: Kei-Ichiro Kobayashi

“Vivid Life” Counseling Room, 3-38-10 Miyoshi-Cho, Fuchu-City, Tokyo, 183-0045 Japan

Tel/Fax: 042-361-5363. E-mail: k.-i.kob@jasmine.ocn.ne.jp

Abstract

The shift in the frequency of voice of a breast cancer patient through SAT imagery therapy was studied with FFT-analysis. The frequency of “AH” in a Japanese word “OKAHANSAN” (or “mother” in English) remarkably decreased from 293-312Hz to 137-185Hz with a change of imagery of her parents to the ideal ones. However, in the therapy where she strongly suppressed her negative emotion with fear of death, a disagreement between verbal (the content of talk) and nonverbal (frequency) was observed. These results show that (1) the frequency of *AH* generally decreases with the improvement of the emotion in the client, (2) the frequency shows an irregular behavior with suppressed subconscious emotion. Therefore, it is found out for the first time that the frequency of “AH” in the Japanese word “OKAHANSAN” can be used as a scale of human emotion.

Key Words. SAT imagery therapy; cancer; frequency; voice; emotion; FFT-analysis

1. Introduction

Information is sent and received in the form of wave which is accompanied with frequency such as light, sound, and electric signal. In the case of information concerning human emotion, vocal expression, facial expression and behavioral expression are very important factors⁽¹⁾. In counseling, vocal conversation is the main medium of interaction between client and counselor. A counselor instinctively accepts a lot of emotional information from the vocal expression of a client. Therefore, it is expected that by analyzing the voice of clients we can obtain a clue to solve human emotion scientifically from a new point of view.

By applying SAT imagery therapy to many cancer patients for several years, not only psychological scales but also physiological data, such as immune function and expression of tumor-suppression genes, have been improved^(2,3,4). Among various tumor-suppression genes, *p53* and *RB* are reported to be very important to prevent and diminish cancer⁽⁵⁾. This indicates that resolving the relationship between mental situation and physiological situation evaluated as the expression of tumor-suppression genes are very important to reduce the number of people who die of cancer.

Hori et al. studied the expression of genes by analyzing the crying of rat with FFT-analysis. Ticked rat gave a peculiar crying with a unique component frequency of 50kHz in the ultrasonic region. In the brain of ticked rat, expression of genes was confirmed⁽⁶⁾. From this point of view, we started researching the change of vocal expression of clients whose physiological data including tumor-suppression genes have been improved prominently through a series of SAT imagery therapies. In our daily life, we speak relatively higher interval in a nervous feeling, and lower interval in a relaxed feeling. Therefore, as the first step, we noticed the frequency of

voice. Consequently, we have detected a very characteristic behavior of vocal frequency, and as a result, found out that vocal frequency can be used as a scale of not only unconscious emotion but also that of subconscious emotion.

2. Experimental

2-1. Application of SAT Imagery Therapy to Cancer Patient

After explanation of scientific grounds of SAT imagery therapy to cancer patients and obtaining their written consent, we started the therapy. We took blood samples to evaluate the immune function and the expression of 4 tumor-suppressor genes; *p53*, *RB*, *BRCA2*, *RUNX3*. Details of the procedure have been reported in a previous paper ⁽³⁾.

2-2. Personal Background and Medical History of the Patient

Patient in this study was a 46-years-old woman. Her mother was very emotional and had a tendency of controlling her and her elder sister. Left breast cancer was recognized at the end of July 2001. The main subject of this patient throughout SAT imagery therapy was a conflict with her mother and sister. Her detailed profiles have been reported in the previous issue^(3,4).

After three to four times of therapy, her psychological scales had been improved and kept this condition since then. Her immunity and the expression of tumor-suppressor genes showed a gradual improvement, and the final stage of her 26 times of SAT therapies satisfactory data were obtained continuously^(3,4).

2-3. Analysis of the Frequency of Voice

The frequency of digitally recorded human voice was analyzed using Ono-Sokki DSO221 FFT-software. In this study, Japanese words “OKAHSAN” and “OTOHSAN” were adopted for “mother” and “father” (in English), respectively. In these words, the long vowels “AH” and “OH” were chosen as the object of FFT analysis, as underlined in Roman alphabetical expression above. The reason is (1) long vowel is adequate for the accuracy of analyzing position, (2) the same vowel in the same word should be analyzed because we pronounce the same vowel in another words in different frequencies even in the same mental situation, (3) frequently spoken words in the counseling are desirable to get plenty of data, (4) we must choose any object word which reflects the human emotion with high sensitivity. Between these two words, “OKAHSAN” (mother) was used mainly and “OTOHSAN” (father) was used complementally.

At first, the voice of a counselor (a late 50's man) was analyzed in order to demonstrate that the frequency of human voice can be used as an index of human emotion. In the case of the counselor, three types of expressions were picked up; (1) strongly affectionate and soulful situation when he was telling the “magic soulful words” to the client, (2) fairly emotionless situation when he asked real or traumatic images to her, (3) slightly affectionate situation where he repeated the ideal and desirable images of her. This was recorded through a psychic counseling to a client without cancer using rebirth and rebearing imagery technique.

In the case of cancer patient, FTT analysis was carried out only for “AH” in “OKAHSAN” in the 1st, 2nd, 4th and the 25th sessions. Situations when “OKAHSAN” was pronounced could be separated into two cases. The first case is that when the client pronounced “OKAHSAN” with positive expression of her mother, and the second case is with negative expression. In this case, only the word “OKAHSAN” was analyzed because this

word was spoken more frequently than “OTOHSAN”.

2-4. Rebirth and Rebearing Imagery Therapy

In Rebirth and Rebearing Imagery Therapy, imagery of parents, grandparents and great-grandparents are changed into ideal ones for the client. At first, actual traumatic images are reminded by Structured Association Technique, then on the ground of these images, ideal images are set. In the course of counseling, counselor asks client about the situation and personality of her parents, and the client answers the real and ideal images of them. Therefore, in this part of the session, both counselor and client said the word “OKAHSAN” and “OTOHSAN” many times.

In this stage, these two words were pronounced by the counselor in two types of tone. The first type is those when the counselor asks her the real image of parents without emotion, the second type is those when he repeats the ideal image of her parents. In this second situation, since the counselor conceives the ideal image of client, tone of “OKAHSAN” and “OTOHSAN” changed to somewhat emotional ones.

After this, the counselor talks to her the “magic soulful words”. As is shown below, in the “magic soulful words”, counselor says the words “OKAHSAN” and “OTOHSAN” repeatedly.

2-5. “Magic soulful words”

To the clients in ideal in-womb images, the counselor tells soulful and affectionate words. At this point, since the counselor is holding his/her most loving person such as his/her children, the voice of the counselor naturally changed into strongly soulful and affectionate tone. “Magic soulful words” are as below.

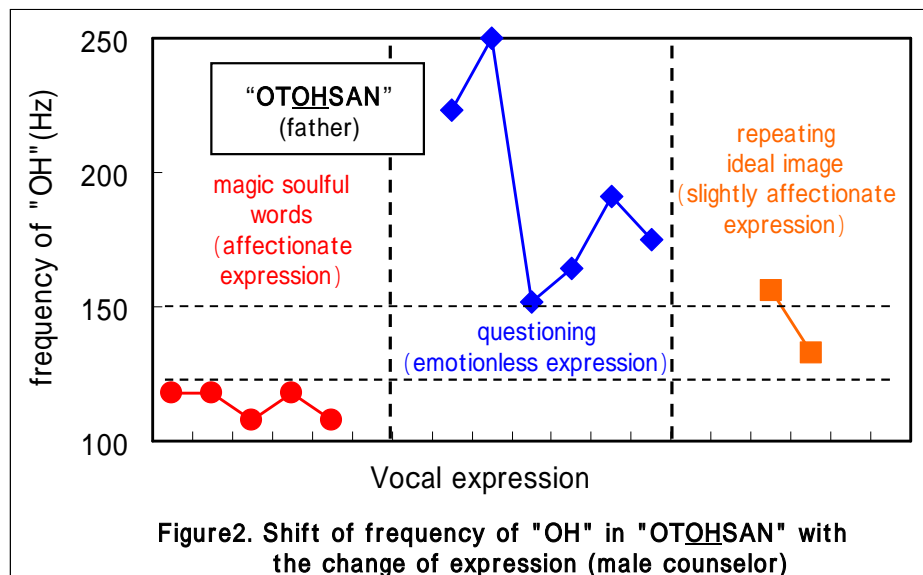
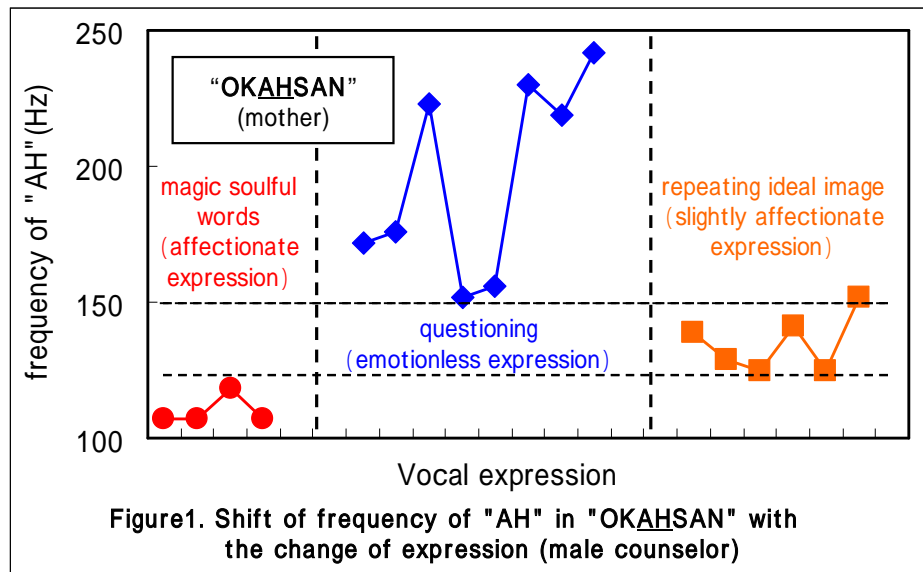
- (1) Father and mother are delighted to be blessed with you, and love you very much.
- (2) Father and mother love you whatever you are, we are impatient for you to bear safely.
- (3) If you might have any trouble, be sure to tell father and mother.
- (4) Father and mother will help you with all our might.
- (5) Live in such a way that you will be grateful.
- (6) Father and mother will be most delightful to feel that you live satisfyingly.

3. Results

3-1. Voice of counselor

FTT analysis was carried out for three types of mental situation: (1) strongly affectionate and soulful situation, (2) fairly emotionless situation, (3) slightly affectionate situation.

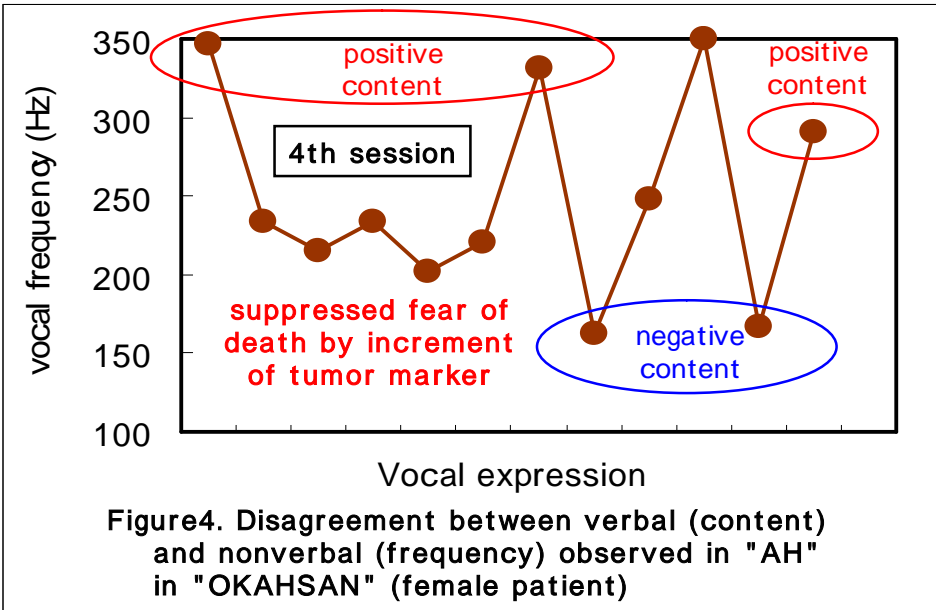
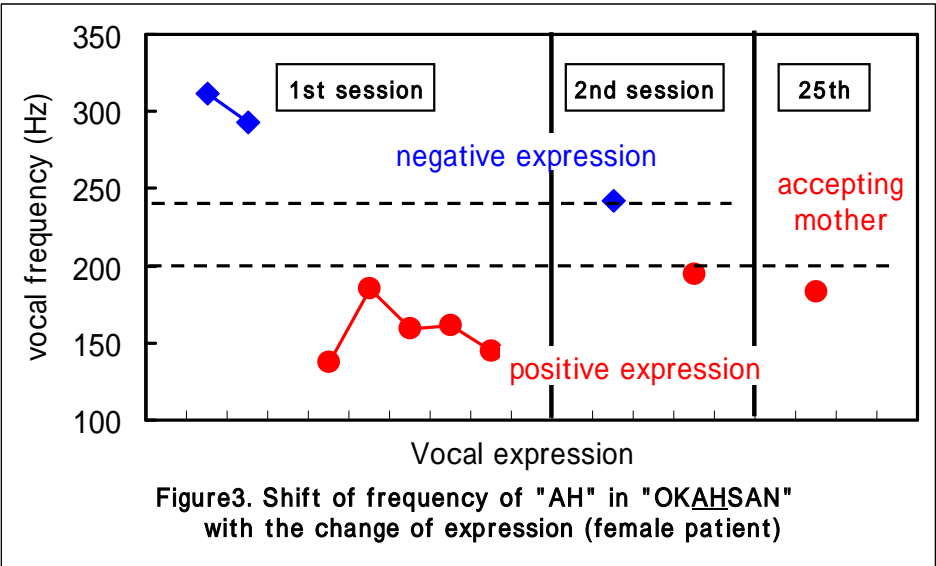
The result of analysis for both “OKAHSAN” and “OTOHSAN” are shown in figures 1, 2. When the counselor said those words very soulfully telling magic soulful words, frequency of long vowel “AH” and “OH” was in the range of 100~120Hz. On the other hand, when he said them in fairly emotionless situation, frequency was in the range of 150~250Hz. In addition, in slightly affectionate situation repeating the ideal images, frequency was in the range of 120~150Hz; the middle range of two situations mentioned above. Therefore, as a result, frequency of long vowel “AH” and “OH” in “OKAHSAN” and “OTOHSAN” decreased from the range of 150~250Hz to that of 100~120Hz, with increasing soulfulness in the mental situation of the counselor. This shows that We are able to use the frequency of “AH” and “OH” in these two words as a scale of subconscious emotion.



3-2. Voice of cancer patient

In the 1st session, remarkable shift was observed in the frequency of "AH" in "OKAHSAN". Since this is the first session, she told the impression of her mother to us frankly. She said "My mother scolded me severely in front of my friend" and "This mother is incredible." In these negative expression, as shown in figure 3, frequency

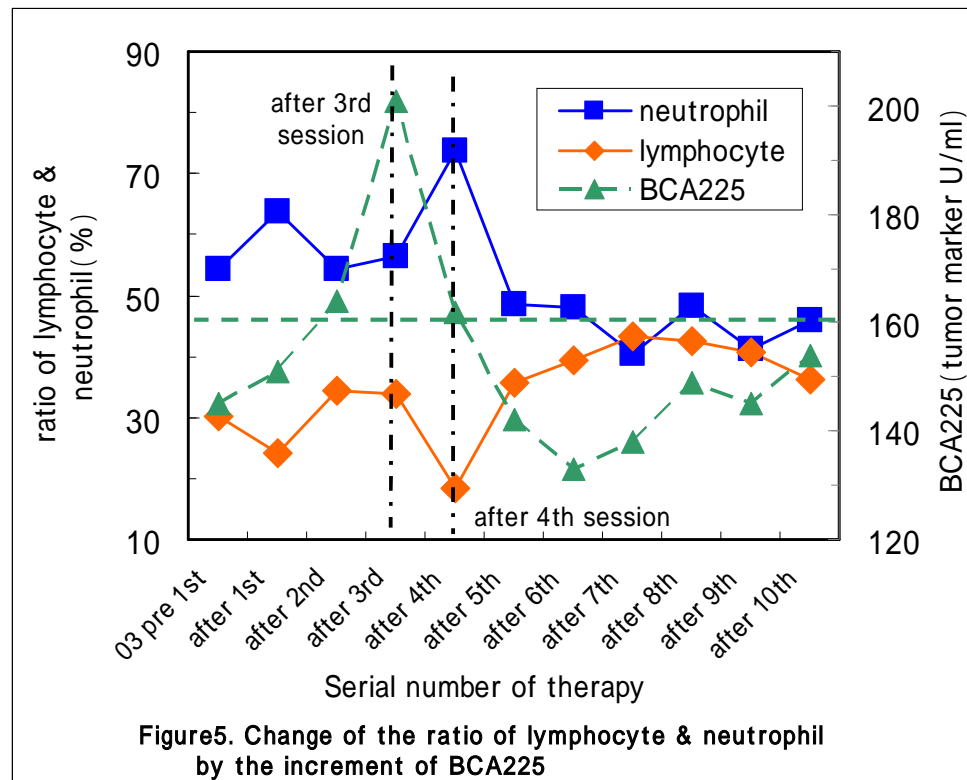
of "AH" was as large as 293-312Hz. On the contrary, having desirable image of her grandparents and great-grandparents through the first session, frequency decreased to 137-185Hz; about 1/2 of that of negative expression. From the viewpoint of musical interval, the effect of ideal image is as wide as one octave. At this stage in an ideal in-womb image, she expressed her mother like this, "An affectionate mother is ideal", "When I am born, mother welcome me".



In the 2nd session, a similar change in frequency was observed as in the 1st session (Fig. 3). In the 4th session, apparently incomprehensible results were obtained. In figure 4, some large frequency data were observed in the positive expression of “OKAHSAN”, and some small frequency data were obtained in the negative expression. This was reversed behavior of the frequency to those observed in the 1st and the 2nd session. When she said “Mother is in a severe atmosphere by being accused ” and “ It makes no difference even if we return to Japan without mother at the end of the world war ”, observed frequency was 162-167Hz; in the range of small frequency. On the contrary, when she said “Mother is expecting baby in a relaxed feeling ”, “Affectionate mother” and “I feel mother is satisfied and happy” frequency was 331-350Hz; in the range of large frequency. There exists a disagreement between verbal (the content of talk) and nonverbal (frequency). This disagreement is the characteristic of the 4th session.

The 4th session was done under strongly suppressed mental situation. At the end of every session, blood sample was taken in order to check the immunitive force, such as the ratio of lymphocytes and neutrophils, and tumor markers. These data were told to the client at the beginning of the next session. As shown in figure 5, at the end of the 3rd session the data of BCA225, a kind of tumor marker for breast cancer, made a sudden increase to 201U/ml which is higher than the standard value (160 U/ml). When the client was told this increase at the beginning of the 4th session, she perceived this as the reoccurrence of cancer with a fear of death. On the other hand, the ratio of lymphocytes and neutrophils at the end of the 3rd session, a scale of the balance between sympathetic nerve and parasympathetic nerve are in their standard range. On the contrary, at the end of 4th session, BCA225 decreased to the standard range and the ratio of lymphocytes and neutrophils became worse, suggesting she had a heavy stress to know the increase in BCA225. Her strong fear was not expressed

in the 4th session, but expressed at the 5th session after being told of the decrease of BCA225. She said “I’m very glad to hear that. I was so shocked to know the increase in BCA225 that I couldn’t speak my fear in the last session. Although I had told you I became positive through SAT therapy, I couldn’t eat meal for a few days after the last session.”



In the 25th session, she said “OKAHSAN” only once. She told us the recent relationship between her mother. She said, she talked to her mother “Mother, you appear to me, even if you fawn on others you would not become happy”. Although the content of this conversation is rather negative, analyzed frequency was 183Hz; in the range of low frequency. She continued “By setting estrangement from my mother, she changed not to ask me what would I do today. She understood the reason. Consequently, relationship between my elder sister was improved. I feel the prospects for the future are very good.” She told about her mother very frankly. Her talk held

both positive and negative contents. But as a whole, she accepted her mother as she was. Since the main subject of this patient is a conflict with her mother and sister, this small frequency confirmed that her therapy could be concluded.

4. Discussion and Conclusion

FTT-analysis applied to the voice of male counselor shows that the frequency of "AH" and "OH" in "OKAHSAN" and "OTOHSAN" decreased from the range of 150~250Hz to that of 100~120Hz with increasing soulfulness in the mental situation of the counselor. This shows that we are able to use the frequency of "AH" and "OH" in these two words as a scale of unconscious emotion.

Also in the case of female cancer patient, the frequency of "AH" and "OH" in "OKAHSAN" and "OTOHSAN" decreased through the SAT imagery therapy in each session. The most remarkable decrease was observed in the 1st session, where the frequency of initial negative expression spoken in 293-312Hz decreased by half to 137-185Hz in the positive expression. In the 25th session, although she spoke about her mother including both positive and negative aspects, the frequency of "AH" in "OKAHSAN" was pronounced at 183Hz; the frequency range of positive expression. Very peculiar reversed behavior of the frequency was observed in 4th session. This behavior agrees with the strongly suppressed extraordinary mental situation of the client, suggesting a disagreement between verbal expression (the content of talking) and nonverbal one (frequency). Taking all these results into consideration, it can be concluded that the frequency of "AH" and "OH" in "OKAHSAN" and "OTOHSAN" can be used as a scale of not only unconscious emotion, but also subconscious emotion of human being with high sensitivity.

Human voice is pronounced by the vibration of the vocal cords. The frequency of string is expressed by the next formula.

$$v = (j/2l)(T/\sigma)^{1/2} \quad (j = 1, 2, 3 \dots)$$

(v: frequency, l: length, j: 1, 2, 3... (integer), T: force, σ : linear density)

According to this formula, when a person get nervous, he or she unconsciously strains the muscle in the vocal cord more strongly, consequently the frequency of the voice increases. This qualitatively agrees with the observed phenomena.

References

- 1) Munakata, T.: SAT Health Psychotherapy Supports our Revolutionary of Way of Life, *Journal of Health Counseling*, 14:1-10, 2008.
- 2) Munakata, T.: Building SAT Therapy to Activate Anti-Cancer Genes and Immunologic Function for Cancer Treatment. *International Journal of Structured Association Technique, Electronic Journal of Social Skill, Counseling and Imagery Therapy*, 1: 3-35, 2007.
- 3) Kobayashi, K.-I., Hashimoto, S., Hayashi, T., Sakamoto, S., Hori, M., Obitsu, R., Murakami, K., & Munakata, T.: Treatment of Patients With Cancer for Stressful Emotion Transmitted from Ancestry by Using Genetic and Immunologic Data as Barometers. *International Journal of Structured Association Technique, Electronic Journal of Social Skill, Counseling and Imagery Therapy*, 1: 36-58, 2007.
- 4) Munakata, T. and Kobayashi, K.-I.: *SAT Imagery Therapy for Cancer*; Shunju-sha, Tokyo, 44-68, 2007.
- 5) Morgenbesser, S.D., Williams, B.O., Jacks, T., & DePinho, R.A. p53-dependent apoptosis produced by

Rb-deficiency in the developing mouse lens. *Nature* 371(1): 72-74, 1994

- 6) Hori, M., Urayama, O., Hayashi, T., Nakagawa, Y., Sakamoto, S., & Murakami, K.: Private Communication.