

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

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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.

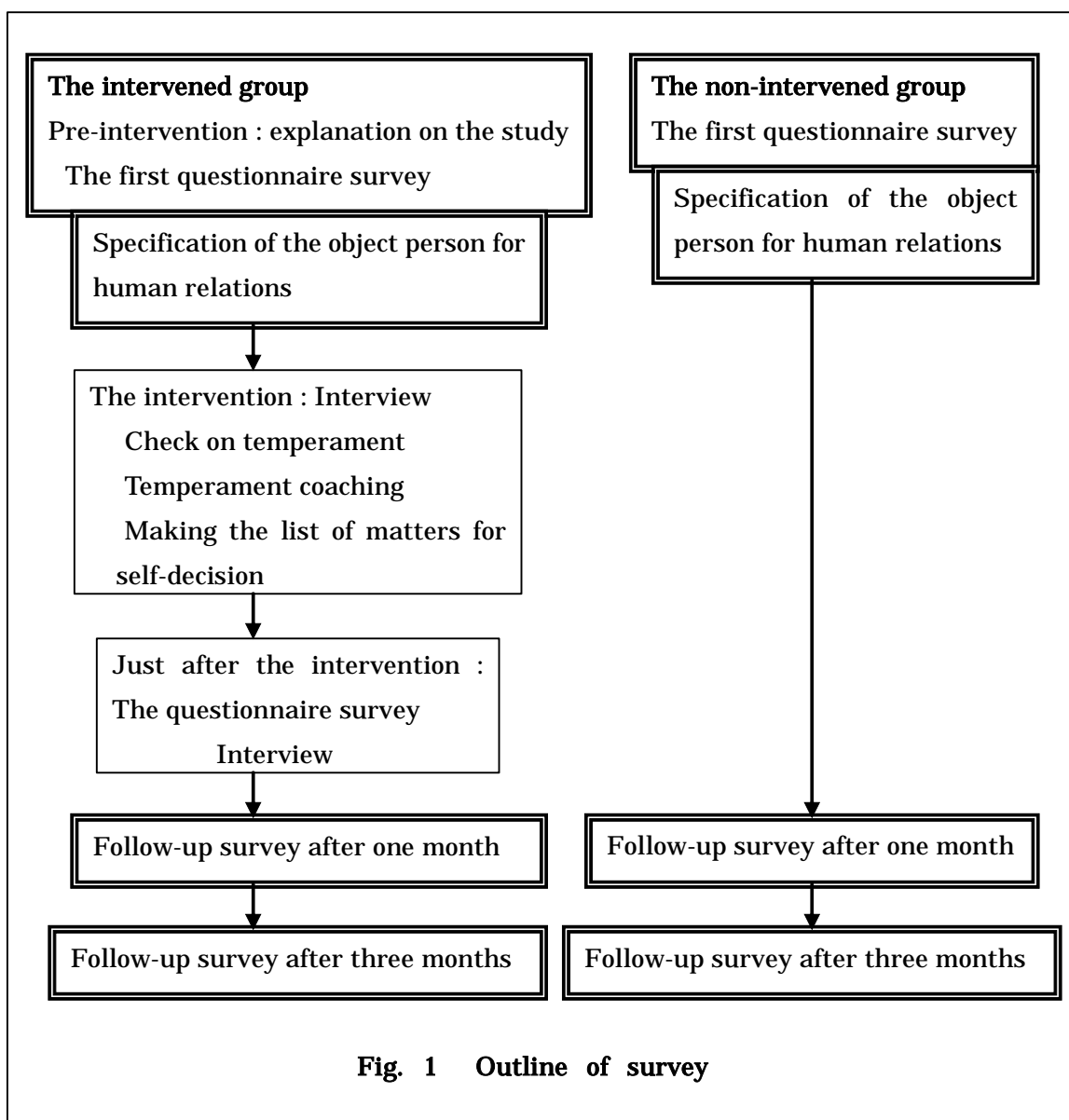
The present study is intended as an intervention based on the theory of temperament coaching for the management of stress caused by human relations to examine the follow-up survey after one month and three months, respectively, and to examine the effectiveness of stress management by this temperament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

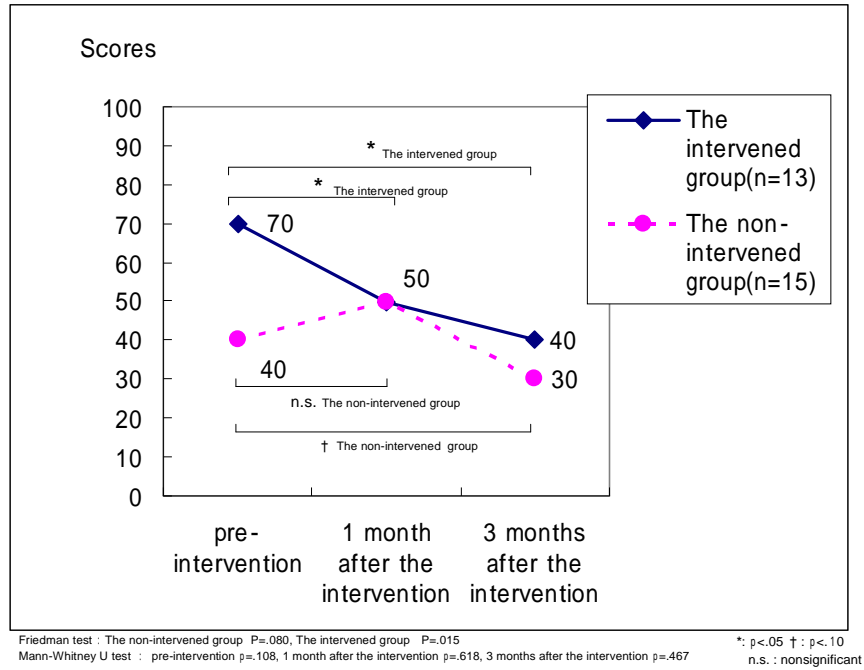


Fig. 2 Changes in the degree of subjective stress

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).

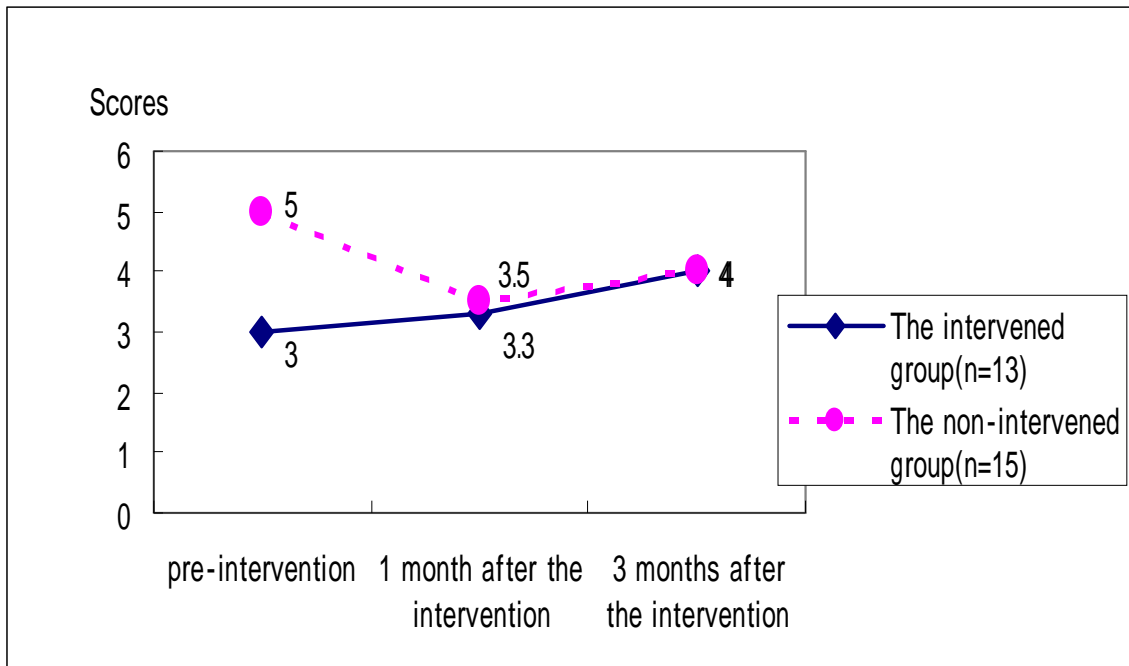
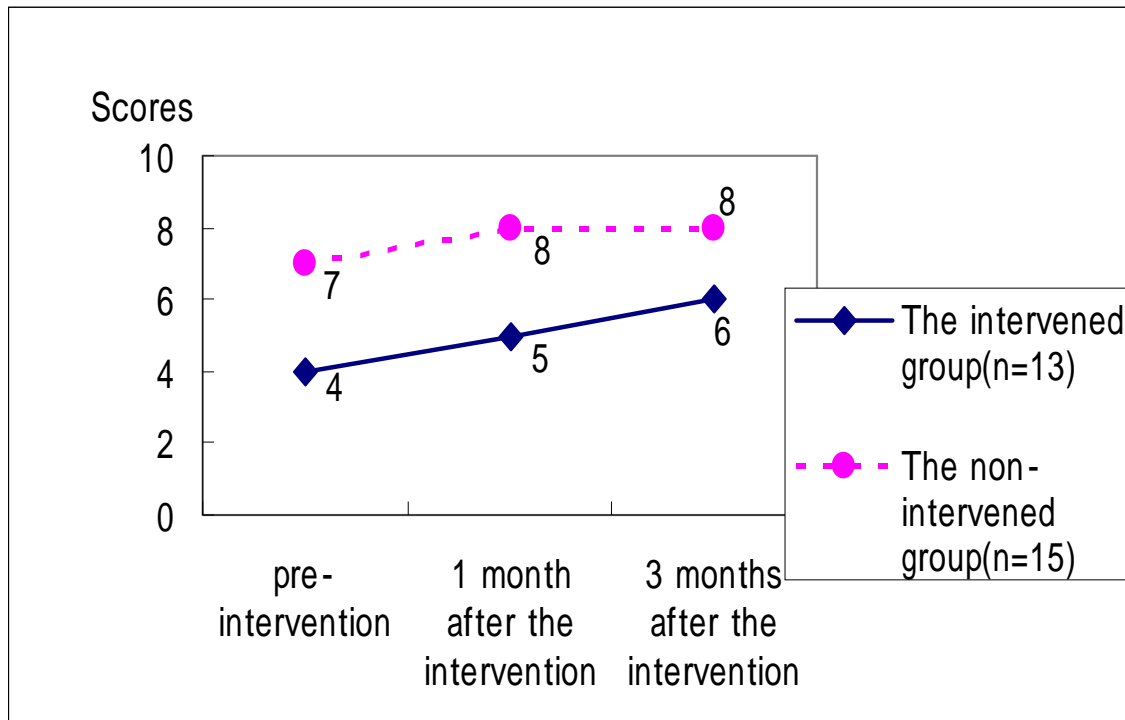


Fig. 3 Changes in human relations scale scores

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.

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