

Vol.4, No.2

**2014**

INTERNATIONAL JOURNAL OF  
BRIEF THERAPY  
AND  
FAMILY SCIENCE

**National Foundation of  
Brief Therapy**

**December, 2014**



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**International Journal of Brief Therapy and Family Science**  
**Vol. 4, No. 2, 2014**

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## **Aftereffect of Adolescents' Experience of Cyber Bullying on Their Mental Health: A retrospective survey**

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**ABSTRACT.** The present study investigates aftereffects of adolescents' experience of cyber bullying. Cyber bullying is defined as bullying via electronic communication tools. We surveyed 321 late adolescent university students in Japan. The results showed that victimization on the internet significantly raised current levels of anxiety and frustration. On the other hand, victimization on the mail did not affect current mental problems. Internet and mail had different communication function (mass communication/ personal communication), so the different function might have different psychological impacts on late adolescent mental health.

**KEY WORDS:** Cyber bullying, Internet, Mail, Traditional Bullying, Mental Health, Aftereffect.

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### **Introduction**

Bullying is usually defined as being an aggressive and intentional behavior that is carried out by a group or an individual repeatedly against a victim who can not easily defend him/herself (Olweus, 1993). Recent study also reflects growing concern about bullying through mobile phones or personal computers. According to previous studies (e.g., Smith, Mahdavi, Carvalho, Fisher, Russell, & Tippett, 2008), we labeled the latter type of bullying as 'cyber bullying' and the former as 'traditional bullying.'

Victims involved in both traditional and cyber bullying are growing concerns. These concerns are partly spread by media reports about children who committed suicide after being victimized by bullies (e.g., Computer Fraud Security, 2008). Although such extreme consequences are rare, previous study showed that victims who were involved in traditional bullying manifested mental health problems, including both internalized and externalized symptoms (Hodges, Boivin, Vitaro, & Bukowski, 1999; Solberg, & Olweus, 2003). However, studies regarding victims involved in cyber bullying are limited (e.g., Li, 2007) and few researches examined aftereffects of cyber victimization. In the face of recent dramatic use of cyberspace, an abuse of cyberspace, such as cyber bullying, should receive more attention. Furthermore, most victims in cyberspace

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survive into adolescence, so aftereffects of the cyber victimization are important. The present study aims to examine aftereffects of cyber victimization in late adolescence by applying stressor model that traditional bully researchers founded (Fekkes, Pijpers, Fredriks, Vogels, & Verloove-Vanhorick, 2006).

### *Literature review*

#### *Mental health of victims involved in traditional bullying*

Victims of traditional bullying have mental health problems. Solberg, & Olweus (2003) conducted questionnaire survey of 5171 students from 11 to 15 years old and found that the more frequently children were bullied, the more they had negative self evaluation and depressive symptoms. Arseneault, Walsh, Trzesniewski, Newcombe, Caspi, & Moffitt (2006) also interviewed 2232 children from 5 to 7 years old, their parents, and teachers. They found that those who were bullied had more internalized behaviors (e.g., similar symptoms of anxiety and depression) than those who were not bullied. Furthermore girls who were bullied had more externalized behaviors (aggressive behaviors: frequently fight with peers) than those who were not bullied, but not boys. Craig (1998) also surveyed 546 children around 11 to 14 years old and found that victims of traditional bullying had more symptoms of anxiety than non victims, but the level of depression and aggression did not differ significantly from victims to non victims. These studies suggested that victims involved in traditional bullying had some mental health

problems, but they did not always manifest the same problems.

Previous study also showed developmental relationships between bully victimization and mental health problems. Fekkes, Pijpers, Fredriks, Vogels, & Verloove-Vanhorick (2006) presented a framework: Stress of victimization develop mental health problems. Fekkes et al. sampled a cohort of 1118 children from 9 to 11 years old in Netherlands and conducted 6-month cohort study. They found that victims felt more symptoms of depression, anxiety, and tension after 6 month, even though they controlled these states at baseline. Hodges, Boivin, Vitaro, & Bukowski (1999) also conducted one-year longitudinal survey including 393 children around 10 years old and found that victims had more internalized and externalized behaviors than those who were not victims. Rønning et al. (2009) also found 10-year aftereffects of victimization on mental health in Finland. Rønning et al. surveyed 2540 eight-year-old boys and diagnosed them after 10 years at the age of 18. They reported that victims had more psychiatric diagnose than those who were not bullied. Sourander et al. (2007) used the same data of Ronning et al. and also found that the victims had more anxiety disorders and depressive disorders than those who were not bullied. Although some studies did not support the aftereffects of victimization (e.g., Klomek et al., 2008), these collective findings suggested that victims involved in childhood bullying were likely to have mental health problems.

***Mental health of victims involved in cyber bullying***

Victims of cyber bullying also have mental health problems. Ybarra & Mitchell (2004) interviewed 1501 children between 10 and 17 years by phone and found that 9.1 % of victims involved in cyber bullying had major depressive like symptoms, whereas only 3.8 % of those who were not involved in cyber bullying had the same symptoms. Baker & Tanrikulu (2010) also surveyed 165 children between 10 and 14 years and found experience as a victim of cyber bullying had a significant positive correlation with depressive symptoms. Other two studies compared mental health between victims involved in cyber bullying and victims in traditional bullying. Gradinger, Strohmeier, & Spiel (2009) surveyed 761 children from 14 to 19 years old and reported that victims involved in either cyber or traditional bullying had significantly more depressive symptoms than non victims. They also found that both victims had similar levels of depressive symptoms. Smith et al. (2008) interviewed 533 students from 11 to 16 years old and found that students perceived some types of cyber bullying (e.g., picture / video clip) had more severe impact on their mental health than traditional bullying. These collective findings suggested that victims involved in cyber bullying also had depressive symptoms like victims involved in traditional bullying.

***Aims of the present study***

Although previous studies informed

relationships between cyber victimization and mental health problems, the studies have two limitations. First, they did not show any aftereffects of cyber victimization on mental health in late adolescence. Second, they mostly focused on depressive symptoms and did neither show any other internalized behaviors nor externalized behaviors that traditional bully researchers focused (e.g., Fekkes et al., 2006). Because the definition of bullying (aggressive behaviors against a victim and a victim cannot defend him/herself) were shared between traditional and cyber bullying (e.g., Smith et al., 2008), the similar stressor would exist in both bullying. Therefore, we applied Fekkes et al. (2006)'s stress model of traditional bullying into cyber bullying. Application of the model can cover these two limitations.

We hypothesized that participants who were cyber bullied would have more negative self evaluation than those who were not cyber bullied (H1). Participants who were cyber bullied would have more internalized behaviors than those who were not cyber bullied (H2). Participants who were cyber bullied would have more externalized behaviors than those who were not cyber bullied (H3). We also made hypotheses regarding traditional bullying. Participants who were traditionally bullied would have more negative self evaluation than those who were not traditionally bullied (H4). Participants who were traditionally bullied would have more internalized behaviors than those who were not traditionally bullied (H5). Participants who were traditionally bullied would have more externalized behaviors than

those who were not traditionally bullied (H6).

### **Methods**

#### *Participants*

Participants were 321 students from three universities in Japan. Two of them were North east district area and the one was central east district area. Male students were 201 and female students were 113. Seven students did not answer their sex. Their mean age was 19.7 (S.D. =1.3). Two students were Thai and Korean, but the other students were Japanese.

#### *Procedure*

Present study was approved by one faculty member and three research groups, including one professor and one associate professor in Tohoku University and Yasuda Women's University, respectively. We conducted questionnaire survey during November 2009 to January 2010. Participants received the questionnaires during beginnings or ends of classes, or between classes. When we handed out the questionnaires, we explained aims of the present study and anonymity and confidentiality of the questionnaire. All participants were voluntary and had right to stop answering the questionnaires if they wished to. After they answered the questionnaires, we collected the questionnaires.

We first questioned their self evaluations and emotional states. Then, we reminded them of experience about victimization involved in cyber and traditional bullying in high school days. This order can minimize carry-over effects of memories of high school days on

current self evaluation and emotional states.

#### *Measures*

##### *Current state*

**Self evaluation:** We used a Japanese version of Rosenberg Self Esteem (RSE) to measure participants' self-evaluation (Rosenberg, 1979; Yamamoto, 2001). RSE uses a 10 item scale anchored with a 5-point scale. Previous studies demonstrated the concurrent, predictive, and constructive validities of the RSE (e.g., Nugent & Thomas, 1993). Participants were asked whether following statements were applicable to them; such as 'I feel that I have a number of good qualities'. 'I take a positive attitude toward myself'. Each item was coded so that a high score on the item reflected high self-esteem. The items were then summed and divided by ten to create a self-esteem scale score. The Cronbach's alpha value of the RSE was .83. The average of RSE was 3.1 (S.D. = 0.7).

**Emotional state:** We used 5 factors of a shortened version of the Profile of Mood States (Shacham, 1983). Five factors are widely used and have predictive and constructive validities (e.g., Shacham, 1983; Yokoyama, 2005). The 5 factors were tension-anxiety, depression-dejection, anger-hostility, frustration, and confusion factor. Each factor uses 5 item scale anchored with a 5-point scale. We calculated the sum of the items for each factor and converted the factor into a T score adjusted for Japanese adults (Yokoyama, 2005). Each average of the factor was 54.3 (11.8), 55.5

(11.8), 49.4 (10.4), 55.7 (10.2), and 58.1 (12.0), respectively. Cronbach's alpha of the factor was also .83, .82, .80, .84, and .63, respectively. We assumed that the anger-hostility factor represented externalized behaviors, whereas the other four factors represented internalized behaviors.

#### *Experience of victims in high school days*

##### *Victim involved in traditional bullying:*

Participants first read following statements: "We asked about your high school days." Then, they read standard definition of bullying (Olweus, 1993). Then, they were asked how long they were bullied<sup>1</sup> and given a choice of 0: never, 1: less than a week, 2: about a month, 3: about a school term, 4: about a year, and 5: about several years. Because Olweus (2003) regarded over one month as an indicator of victims, those who answered more than choice of 1 were regarded as victims in traditional bullying. Traditionally Bullied Victims (TBV) were 16 (5.1 %) and 9 were female (One participant did not answer one's sex). Non-victims were 300. Five participants did not answer the question.

*Victims involved in cyber bullying:* Participants were also asked how long they were bullied by e-mail (Mail) and how long they were bullied by Message board, Weblog, or Profile site (the Internet) and were given the same 6 choices as the TBV. It is not uncommon in the previous studies of cyber bullying to count a single incident as an experience of cyber bullying (e.g., Raskauskas, & Stoltz, 2007; Wang,

Iannotti, & Nansel, 2009), so those who answered more than 0 were regarded as victims involved in cyber bullying. Cyber victims were 17 (5.5 %) and non victims were 294. Ten participants did not answer either two questions. We also divided the cyber victims into the Mail Bullied Victims (MBV) and Internet Bullied Victims (IBV), because mail is a personal communication by the electronic devices, whereas the internet is a mass communication by the devices. Different communication functions imply different effects on human behaviors. Actually, many researchers treat the two victims differently (e.g., Li, 2007; Raskauskas & Stoltz, 2007; Smith et al., 2008). The MBV were 5 and 2 were male (One participant did not answer one's sex). The IBV were 16 and 8 were male (One participant did not answer one's sex).

#### *Analysis*

First, to grasp a whole picture of the present study, we analyzed correlations among all variables we used. Second, we conducted multiple regression analysis to show original aftereffects of TBV, MBV, and IBV on current self evaluation and emotional states. Third, self evaluation and emotional states of victims and non-victims were analyzed by Man-Whitney test. SPSS 14.0 in Japanese version was used.

#### **Results**

##### *Correlations between variables*

First, we compared all variables the present study used (Table1). Table1 shows that every emotional factor had significant positive

correlations with each other, so each factor was closely-linked like previous studies (Shacham, 1983; Yokoyama, 2005). RSE also have significant negative correlations with these emotions. These correlations were also consistent with previous studies (e.g., Nugent & Thomas, 1993).

Duration of TBV, IBV, and MBV also had positive correlation with their sex and both their age and sex had significant positive correlations with duration of TBV. Therefore,

when we interpret aftereffects of duration of TBV, we need to take participants' age and sex into consideration. On the other hand, aftereffects of duration of IBV and MBV significant positive correlation with each others. Therefore, victims in school were also victims on the Internet and Mail (Li, 2007; Raskauskas & Stoltz, 2007; Smith et al., 2008). Especially, duration of IBV during high school had significant positive correlations with current anxiety and frustration levels.

Table1

Correlations among internalized behaviours, externalized behaviours, self evaluation, victim experience, and basic traits

		2	3	4	5	6	7	8	9	10	11
Internalized behaviours	1.TA	.65 <sup>h</sup> **	.61 <sup>h</sup> **	.69 <sup>h</sup> **	.44 <sup>h</sup> **	-.40 <sup>f</sup> **	.08 <sup>g</sup>	.15 <sup>d</sup> **	.09 <sup>b</sup>	-.00 <sup>e</sup>	.08 <sup>e</sup>
	2.DD		.57 <sup>h</sup> **	.69 <sup>h</sup> **	.60 <sup>h</sup> **	-.50 <sup>f</sup> **	.04 <sup>g</sup>	.10 <sup>d</sup>	-.00 <sup>b</sup>	-.06 <sup>e</sup>	.03 <sup>e</sup>
	3.FT			.63 <sup>h</sup> **	.48 <sup>h</sup> **	-.39 <sup>f</sup> **	.00 <sup>g</sup>	.11 <sup>d</sup> *	.05 <sup>b</sup>	-.08 <sup>e</sup>	.01 <sup>e</sup>
	4.CF				.47 <sup>h</sup> **	-.47 <sup>f</sup> **	.03 <sup>g</sup>	.10 <sup>d</sup>	.04 <sup>b</sup>	-.02 <sup>e</sup>	.05 <sup>e</sup>
Externalized behaviours	5.AH					-.24 <sup>f</sup> **	.01 <sup>g</sup>	.04 <sup>d</sup>	.09 <sup>b</sup>	.02 <sup>e</sup>	.03 <sup>e</sup>
Self evaluation	6.RSE						-.01 <sup>i</sup>	-.08 <sup>f</sup>	.04 <sup>b</sup>	.11 <sup>f</sup> *	-.08 <sup>c</sup>
Victim Experience	7.TBV							.27 <sup>h</sup> **	.29 <sup>b</sup> **	.17 <sup>h</sup> **	.13 <sup>e</sup> *
	8.IBV								.11 <sup>b</sup> *	.08 <sup>e</sup>	.05 <sup>b</sup>
	9.MBV									.05 <sup>c</sup>	.06 <sup>a</sup>
Basic traits	10.Age										.24 <sup>f</sup> **
	11.Sex										

a:  $n = 306$ , b:  $n = 308$ , c:  $n = 309$ , d:  $n = 310$ , e:  $n = 311$ , f:  $n = 312$ , g:  $n = 313$ , h:  $n = 314$ , i:  $n = 315$ .

\*:  $p < .05$ , \*\*:  $p < .01$ . TA: Tension and Anxiety, DD: Depression and Dejection, FT: Frustration, CF: Confusion, AH: Anger and hostility, RSE: Rosenberg Self Esteem, TBV: duration of Traditionally Bullied Victim, IV: duration of Internet Bullied Victim, MV: duration of Mail Bullied Victim, Sex: counted Female as 1 and Male as 0.

Participants' age had a significant positive correlation with their sex and both their age and sex had significant positive correlations with duration of TBV. Therefore, when we interpret aftereffects of duration of TBV, we need to take participants' age and sex into consideration. On the other hand, aftereffects of duration of IBV and MBV were free of contaminants of participants' basic traits.

IBV had significant coefficients, whereas duration of TBV and MBV did not have any significant coefficients. Duration of IBV especially predicted current higher anxiety and frustration levels. These findings implied that duration of IBV had aftereffects on anxiety and frustration, but duration of TBV and MBV did not have.

*Multiple regression analysis*

Second, multiple regression analysis were conducted. Dependent variables of the analysis were emotional states and self evaluation, and independent variables were duration of TBV, IBV, and MBV. Basic traits were also entered as independent variables.

*Comparison between victims and non-victims*

Third, self evaluation and emotional states of victims and non-victims were analyzed by Man-Whitney test. Since MBV and TBV did not differ from non victims about self evaluation and emotional states, we presented only IBV and non-victims. Table 3 shows significant differences between IBV and non victims regarding internalized behaviors, such as tension, anxiety, frustration, and depression.

Collective results of the analysis were in table 2. Table 2 shows that only duration of

Table 2  
Regression from Victimization during high school on mental health during university

		Dependent variables					
		TA	DD	AH	FT	CT	RSE
Independent variables	TBV	.07	.07	-.00	.00	.03	-.02
	IBV	.13*	.09	.03	.12*	.09	-.08
	MBV	.05	-.03	.09	.04	.02	.06
	Age	-.02	-.09	.01	-.09	-.04	.13*
	Sex	.06	.04	.02	.01	.05	-.10
Effect size	$R^2$	.04	.02	.01	.02	.01	.03
	$F$	2.5*	1.4	0.7	1.5	1.0	1.8

$N = 300$

\*:  $p < .05$ , TA: Tension and Anxiety, DD: Depression and Dejection, FT: Frustration, CF: Confusion, AH: Anger and hostility, RSE: Rosenberg Self Esteem, TBV: duration of Traditionally Bullied Victim, IBV: duration of Internet Bullied Victim, MBV: duration of Mail Bullied Victim, Sex: counted Female as 1 and Male as 0.  $R^2$ : Adjusted  $R^2$

Although the confusion factor did not reach significance ( $U = 1589$ ,  $p = .06$ ), the effect size was nearly medium ( $d = .48$ ), so we thought IBV had more confused than non-victims. On the other hand, externalized behaviors and self esteem did not have significant differences between IBV and non-victims. The small effect size also suggested the small differences. Therefore we regarded that experience of IBV have aftereffects on internalized behaviors, but not externalized behaviors and their self esteem.

The present study examined the aftereffects of cyber victims. We admitted limitations of our study that the participants were only university students and some victims who had not entered university were not included in our study, so the generalization of the present study was limited. Furthermore, retrospective study could bias participants' experiences in high school age. However, the findings of the present study suggest important implications for psychological impact of computer use on individual. As hypothesized, participants who were cyber bullied have more

### ***Discussion***

Table 3

Comparison of internalized behaviors, externalized behaviors, and self evaluation between internet victims and non victims

		Internet Bullied		non victims		<i>U</i>	<i>d</i>
		Victims		on the Internet			
		n = 16		n = 296			
		<i>M</i>	<i>S.D.</i>	<i>M</i>	<i>S.D.</i>		
Internalized behaviors	TA	62.7 <sup>a</sup>	10.3	53.8 <sup>b</sup>	11.7	1259**	0.75
	DD	63.6 <sup>a</sup>	9.8	55.0 <sup>b</sup>	11.6	1199**	0.73
	FT	61.0 <sup>a</sup>	9.4	55.4 <sup>b</sup>	10.2	1514*	0.54
	CF	63.5 <sup>a</sup>	11.5	57.7 <sup>b</sup>	11.9	1589	0.48
Externalized behaviors	AH	52.9 <sup>a</sup>	10.0	49.3 <sup>b</sup>	10.4	1701	0.33
Self evaluation	RSE	2.9	0.4	3.1	0.7	1842	0.35

a:  $n = 15$ , b:  $n = 295$ , \*:  $p < .05$ , \*\*:  $p < .01$ . TA: Tension and Anxiety, DD: Depression and Dejection, FT: Frustration, CF: Confusion, AH: Anger and hostility, RSE: Rosenberg Self Esteem

internalized problems, such as tension, depression, and frustration than those who were not. This finding supported H2. Those who were cyber bullied were not significantly different from those who were not in terms of their externalized behaviors, and self-evaluation. These findings neither support H1 nor H3. According to previous findings (Baker & Tanrikulu, 2010; Gradinger et al., 2009) and our findings, cyber bullied victims might be more likely to suffer from their internalized emotion, rather than their externalized emotion and self-evaluation.

On the other hand, experience of TBV did not have any significant aftereffects. These findings did neither support our hypotheses (H4, H5, and H6) nor match with previous studies (Fekkes et al., 2006; Hodges et al., 1999; Rønning et al., 2009; Sourander et al., 2007). However, the previous studies did not always show the same symptoms caused by TBV and one study did not find aftereffects of experience of TBV (Klomek et al., 2008). These studies and the present study suggested that TBV may manifest various symptoms, but not always the same symptoms. Therefore, TBV infrequently suffered from negative mental health.

We also found that experience of IBV had significant aftereffects on internalized behaviors, such as anxiety and frustration, whereas experience of MBV did not have any significant aftereffects. These findings suggested different communication function (Internet as mass communication and mail as personal communication) have different impacts on human emotional states, even

though the electrical devices might be the same (mobile phone or personal computer). Previous studies surely focused these differences (e.g., Li, 2007; Raskauskas & Stoltz, 2007; Smith et al., 2008), but the studies did not show any relationship between communication function and emotional states. Our study uncovered the links between past internet victimization and current anxious or depressive levels. The study also implied that different communication function via the device were important factor on human health.

Findings of the present study were interpreted two ways. First, both anonymity and worldwide attention on the internet make mental health of IBV worse. The anonymity of the internet makes IBV indefensible. IBV cannot know bullies on the internet (e.g., Baker & Tanrikulu, 2010; Smith et al., 2008; Ybarra & Mitchell, 2004), whereas bullies can attack IBV at any time. Furthermore, most contents on the internet cannot be deleted by IBV (e.g., Gradinger, Strohmeier, & Spiel, 2009), whereas the contents were always available for everybody in the world (e.g., Computer Fraud and Security, 2008; Raskauskas & Stoltz, 2007). IBV cannot defend themselves and cannot delete personal information or disparaging remarks on the internet even though the bullying was finished. As a result, contents that IBV want to keep dark have been always exposed to other people since the bullying. In other words, their victimization never ends. These situations may cause significant negative impacts on their mental health.

On the other hand, traditional and mail

bullying were basically personal and victims can defend themselves through the change in address. TBV can defend themselves, when they transferred their school. MBV can defend themselves, when they changed their mail address. Furthermore, most contents on the mail can be deleted by victims and the contents were usually available only for small local group members. This means that when the bullying was finished, the contents were naturally disappeared. These mail traits may protect MBV from negative impact on their mental health.

The second interpretation of the findings was difficulty to offset internet victimization with alternative positive experience. IBV were aggressed repeatedly by anonymous person (Computer Fraud and Security, 2008; Raskauskas & Stoltz, 2007). In order to offset the victimization, victims receive complements repeatedly by anonymous person. However, this alternative offset rarely happens. As a result, IBV suffered from their negative experience on the internet.

On the other hand, traditional and MBV can easily offset their victimization with alternative experiences. For example, because TBV were aggressed repeatedly by peers, their positive relationships with peers can offset their victimization. Actually, good peer relationships have significant protective effects on internalized and externalized behaviors (Hodges et al., 1999). In the similar way, heartfelt praise by mail would have protective effects on mental health, because MBV were aggressed repeatedly by mail. Therefore, TBV

and MBV can recover from their negative mental health via their good peer relationships. Good peer relationships may also compensate of negative experience of IBV.

### **Conclusion**

The present study contributed to studies on bullying in practical and theoretical ways. First, our study examined aftereffects of cyber victimization. Cyber victimization, especially internet victimization, had negative impacts on late adolescent mental health. Our finding suggested the importance of adolescent cyber space. Hence, to understand adolescents, psychologists have to take into account not only their real life, such as family and classroom, but also cyber life, such as activity on web sites. Understandings of cyber life could shed a light on adolescent health from another perspective.

Second, our study also examined different psychological impact of computer (mobile phone) uses on individuals. Internet victimization had significant aftereffects on late adolescent health, but mail victimization did not. Internet use gives all people power of mass communication. Surely, mail use facilitates personal communication, but did not give the power of mass communication. Difference of power might cause different aftereffects. For example, people who were written into personal information on websites would suffer than those who were written on e-mail, because they cannot delete information on websites like e-mail. Division of cyber bullying into personal and mass communication categories could help

to show more detailed relationships between usage of computer and human mental health.

### **Acknowledgement**

The present sample was analyzed in two Japanese papers (Yokotani, Itakura, Ban, Ayukawa, & Hasegawa (2010). Timing of cyber bullying. *Annual Reports of Counseling Room in Tohoku University*, 8, 64-79,; Yokotani, Ban, Ayukawa, Itakura, & Hasegawa (2012). Who diffuse cyber bullying? *Annual Reports of Niigata Seiryō University*, 6, 31-39), but analytical method of the present study was different from the methods of these previous papers.

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<sup>1</sup> In Japanese, 'bully' usually means traditional bullying, so this question asks about traditional bullying. In English, bullying means both cyber and traditional bullying, but it only means traditional bullying in Japanese.

## Study on Developmental Transformation in Sibling Relationship Based on the Family System Theory: Cases of First Children

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**ABSTRACT.** This study provides an exploratory discussion on the developmental transformation of sibling relationship that follows their family system developments. Nine first children in their fifties and sixties were chosen to receive semi-structured interviews.

The result found a model consisting of five phases depicting the developmental transformation of sibling relationship: (1) Family Phase (the foundation of the sibling relationship is formed); (2) Independent Phase (siblings start to see each other as equals); (3) Relative Phase (siblings establish their own families and maintain sibling relationship as relatives); (4) Care Phase (siblings cope with each other in support of their aging parents); and (5) Integration Phase (siblings build strong spiritual bonds with other siblings after their parents' death).

From these findings, it was clarified that the developmental transformation of sibling relationship is generated through the repeated reformation of the family structure along with the changes in their family system.

**KEY WORDS:** Sibling relationship, Family system, Developmental transformation

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### **Introduction**

Siblings are close other people with associations over a long time, sometimes longer than parents or spouses, and living in the same time period (Adachi, 1999). Sibling relationship continues throughout a person's life, and has various phases. During infancy and school age, there is a hierarchical relationship between siblings, such that the firstborn child cares for the second child (Brody, Stoneman, Mackinnon, & Mackinnon, 1985; Furman & Buhrmester, 1985). In puberty and adolescence, conflicts among siblings decrease,

equal and friendly relationships are often observed (Buhrmester & Furman, 1990; Scharf, Shulman, & Avigad-Spits, 2005). After adolescence, contacts among siblings decrease until middle age, and after that, a certain degree of contacts are observed (White, 2001). When people get old, siblings become important sources emotional support once again (Yoshihara, 2006).

It has been suggested that changes in sibling relationships described above are caused by psychological development of individuals and changes in the parent-child relationship (e.g. Kim, McHale, Wayne, & Crouter, 2006). However, psychosocial backgrounds of the changes have not been empirically investigated. Individuals have been included in various systems (Bronfenbrenner, 1981). For example, from the perspective of family system theory,

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which considers the “family as a system that functions through patterns of interaction (Minuchin, 1974),” sibling relationships are considered as being affected by interactions with family members, regardless of age. However, after adolescence, psychosocial conditions related to siblings have not been investigated even in clinical reports.

Carter & McGoldrick (1989) suggested a family life cycle model consisting of six stages. They described that development of a family system is attained through abandoning, or correcting relationships and rules that were adaptive in the former stage, and reorganizing the family structure. Usami, Kozuka, Hiraizumi, Morikawa, Furuyama, & Wakashima (2011) conducted a questionnaire survey on changes in family structures and indicated that bonds and power balance of family members changed as children grew up. In other words, a family develops as its members grow up, by changing its structure. Therefore, development of sibling relationships is considered to be achieved through changes in relationships and rules of the family, which are caused by developments in the family system. It would be useful to focus on the system surrounding siblings and examine the development of sibling relationships from the perspective of family system theory for obtaining data related to family therapy. This study explores developmental transformations in sibling relationships from the perspective of changes in family relationships, as the system surrounding siblings, with the aim of developing research hypotheses.

## *Methods*

### *Participants*

Firstborn children in their 50s or 60s with siblings, living in the Tohoku and Chugoku regions participated in the study (average age=57.65,  $SD=4.65$ ). In order to maintain simplicity, this study examined the viewpoint of older brothers and sisters regarding the sibling relationship. Furthermore, for the purpose of examining changes in sibling relationships in a series of events, instead of through individual facts, participants in their 50s and 60s were required to recollect their past memories. People in their 70s were excluded because they had experienced a certain degree of life events and were considered to have something in common with other generations, since they grew up after World War II.

Table 1 shows participants' sex and details of siblings. The participants included six women and three men.

### *Data collection methods*

The author directly or through acquaintances asked the participants to take part in the survey. Semi-structured interviews minutes were conducted during 30-60 from July to September in 2010. The place of the interviews was decided through negotiations with the participants. The contents of interviews were recorded using an IC recorder, after obtaining the agreement of the participants.

### *Contents of questions*

The author asked the participants about the

state of their relationship with their siblings in the past and at the present, by following the items below as a guide. Depending on the situation, the order and contents of questions were flexibly changed.

Guide items

- ① Were bonds between siblings strong or weak when you were a child/a student/left home/ got married/were bringing up children/at present?
- ② Why did you feel as you replied to question ①? Please tell me the relationship with your siblings at each of these periods.
- ③ What was the relationship between you and other family members (parents or spouses) and between your siblings and other family members (parents or spouses) at each time?

*Ethical considerations*

Before the survey, the author explained about the aim of this study, protection of their anonymity, and their right to freely refuse to answer questions or take part in the survey and obtained their agreement to participate in the study. The author also explained to them that the data resulting from the study would be used

only for research purposes and how the data would be stored, used, and destroyed.

*The framework of analysis*

This study aims to develop a hypothesis. For this purpose, the author used Modified Grounded Theory Approach (Kinoshita, 2003) in the analysis, which is known to be suitable for bottom-up model construction based on interview data.

*Analysis methods*

- ① Recorded data were made into texts following the protocol.
- ② In order to show the changes in relationships with siblings and other family members, the following parts in the data were extracted and given concept names: (1) Communication with siblings, (2) Feelings toward siblings, and (3) Communication between the participants and other family members, or between the siblings and other family members.
- ③ Before developing the concepts, an analysis worksheet was made and the name of the concepts, definitions, and

**Table1** Attributes of the participants

	Sex	Age	The number of siblings	Gender Composition
A	Female	61	3	Sister/Brother/Brother
B	Male	59	2	Sister/Sister
C	Male	63	2	Brother/Brother
D	Male	51	2	Brother/Brother
E	Female	65	3	Sister/Sister/Sister
F	Female	53	2	Sister/Brother
G	Female	57	5	Sister/Sister/Brother/Brother/Sister
H	Male	52	2	Brother/Brother
I	Female	57	2	Sister/Sister

concrete examples were entered.

- ④ Simultaneously, concrete examples were searched from other parts in the data, and added to the worksheet. Through considering the relationship between the concepts, mutual correlations were examined. Data were analyzed by repeating the processes ③ and ④.
- ⑤ Validity of the concepts that were developed was examined by confirming similar examples and by comparing examples including the opposite content. Thus, it was attempted to prevent arbitrary interpretation.
- ⑥ The period when similar concepts were observed was regarded as a developmental phase, and several phases were developed.
- ⑦ In each phase, relationships between concepts were examined one by one, and categories were developed. Relationships between the categories were examined.
- ⑧ Finally, the concepts were expressed using simple sentences, results of each phase were summarized, the entire flow was confirmed, and the results were expressed in a diagram.

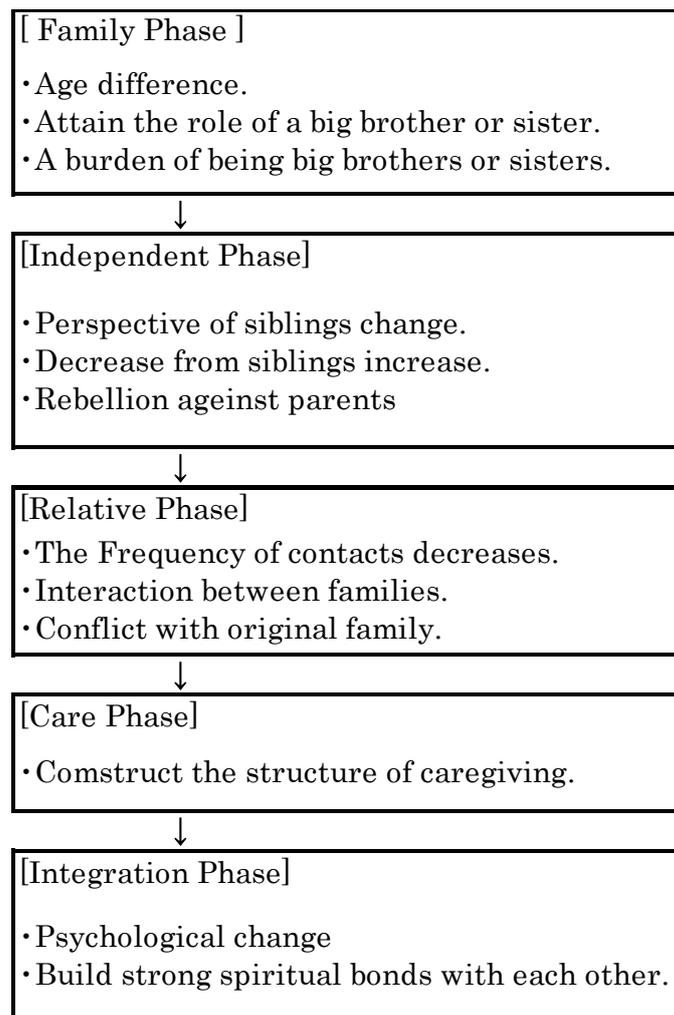
### **Results**

Table 2 shows categories that were developed based on relationships among concepts in each phase. Figure 1 shows the relationship among categories and concepts. Explanation of Figure 1 using a story line is indicated below ( “ ” stands for concepts, [ ] stands for sub-categories, and [ ] stands for categories).

The first phase was the [Family Phase], in which elder children learn how to get involved with their younger siblings through communication with parents, repeatedly dealt with as older brothers or sisters. When younger children are born, parents repeatedly tell older children to take care of and give priority to their siblings. Thus, older children are “trained as elder brothers or sisters,” come to “take care of their younger siblings,” and get to [attain the role of a big brother or a sister] . As they feel [age differences] because their physique and abilities are different from younger siblings, they become aware of their position as elder brothers or sisters. On the other hand, they feel “burdened by the role” because they cannot play with their friends freely, or they have to give their dependence on their parents. Simultaneously, they feel “expectations from their parents about their role as elder children.” Owing to such conflicting psychological conditions, they feel [a burden of being big brothers or sisters] .

The second phase is the [Independent Phase], in which sibling relationships gradually change into an equal relationship with physical growth, and a distance from the family increases. [Age differences] are not to be felt by the elder children, younger siblings change from those they have to look after to peers, giving or receiving advice or rivaling each other. There is a “transformation of the sibling relationship” and [perspective of siblings change] .

Simultaneously, “the frequency of contacts with siblings decreases” and that with friend increases. Thus physical and mental [distance



**Figure1** Feature of sibling relationships at each phase

from siblings increase】. Furthermore, the 【rebellion against parents】 begins.

The third phase is the [Relative Phase], in which siblings come to have a relationship as relatives. When children get a job, or get married, they begin to “give priority to their own job and family.” 【The frequency of contacts decreases】 because they get together only at special events, such as Bon Festivals, or New Year’s holidays. On the other hand, as each sibling come to have their own family, new “relationships between spouses” and “relationships with nephews and nieces”

develop. Through “family leisure activities,” 【interaction between families】 are initiated, instead of interaction with individual sibling. However, sometimes, there are conflicts in which parents and siblings get involved, and 【conflicts with the original family】 occurs. As parents get older, the [Care Phase] begins. Siblings have to talk about caring for their parents. Again they have to often get together, “cooperate among siblings” for caring for their parents. By getting the “spouses’ cooperation” , 【construct the structure of caregiving】 , which consists of siblings and

**Table2** Categories and concept names

Categories	Sub-categories	Name of concepts	Definition	The number of talks	The number of the persons included in the category
P F h a m s i e l y	Attain the role of a big brother or a sister	Training to play big brother/sister roles	Trained by parents to care for or give priority to younger siblings, by dealing with them as a big brother or sister	9	5
		Taking care of younger brothers/sisters	Considering and taking care of younger siblings as a big brother/sister	9	5
	Age difference	Age differences	Recognizing younger siblings as weak, little people	3	3
	A burden of being big brothers or sisters	Parents' expectation as a big brother/sister	Sensing parents' unspoken expectations Difficulties in big brother/sister roles	6	5
		Burdened of a bigbrotherly/bigsissterly role	Feeling burdened by taking cared of younger siblings	5	3
P h d d a e e n p e n	Perspective of siblings change	Transformation of the sibling relationship	Feeling changes in siblings perspectives	5	5
		Equal relationship	Giving or receiving advice, talking, and competing each other	5	5
	Distance from siblings increase	Decrease in contact frequency	Contacts with siblings decrease, interactions with friends increase	4	3
	Rebellion ageinst parents	Rebellion against parents	Feeling rebellious against parents and disobeying	3	3
R e P l h a t s i e v e	The frequency of contacts decreases	Giving priority to one's own job and family	Giving priority to one's own job and family, than to siblings	3	3
		Contact at special events	Siblings get together just at special events, such as New Year's holidays or Bon Festival	4	4
	Interaction between families	Relationships between spouses	Own spouse and sibling's spouse develop good relationships	3	3
		Relationships with nephews and nieces	Having close relationship with nephews and nieces	3	3
		Family leisure activities	Enjoying leisure activities with sibling's family, e.g. going on trips	3	3
Conflict with original family	Conflicts with the original family	Conflicts with parents or siblings about parent-child relationships	2	1	
P h a r s e	Construct the structure of caregiving	Cooperation among siblings	Cooperating with siblings to care for parents	3	2
		Spouses' cooperation	One's own or siblings' spouses support care giving	2	2
P t h i e a o g s n r a	Psychological change	Changes in familiarity	After parents' death, feeling closer to siblings	6	3
		Regrets about sibling relationships	Looking back over former sibling relationships and feeling regret	3	2
	Build strong spiritual bonds with each other	Consideration for siblings	Considering one another between siblings	6	4

their families. After going through the [Care phase], the closeness between siblings increase, because they cooperated with each other for caregiving and because they have lived through the same time period. Thus there are “changes in familiarity”. On the other hand, they look back over the past relationship and reconsider past events, and sometimes feel “regrets about the sibling relationship.” Thus [psychological changes] are caused, and they [build strong spiritual bonds with each other] and come to “consider each other”, their condition, their health, among others. This phase is the [Integration Phase], in which they start to establish a new sibling relationship, without being intermediated by their parents and [perspective of siblings change]. Simultaneously, “the frequency of contacts with siblings decreases” and that with friend increases. Thus physical and mental [distance from siblings increase]. Furthermore, the [rebellion against parents] begins.

The third phase is the [Relative Phase], in which siblings come to have a relationship as relatives. When children get a job, or get married, they begin to “give priority to their own job and family.” [The frequency of contacts decreases] because they get together only at special events, such as Bon Festivals, or New Year’s holidays. On the other hand, as each sibling come to have their own family, new “relationships between spouses” and “relationships with nephews and nieces” develop. Through “family leisure activities,”

[interaction between families] are initiated, instead of interaction with individual sibling.

However, sometimes, there are conflicts in which parents and siblings get involved, and [conflicts with the original family] occurs.

As parents get older, the [Care Phase] begins. Siblings have to talk about caring for their parents. Again they have to often get together, “cooperate among siblings” for caring for their parents. By getting the “spouses’ cooperation”, [construct the structure of caregiving], which consists of siblings and their families. After going through the [Care phase], the closeness between siblings increase, because they cooperated with each other for caregiving and because they have lived through the same time period. Thus there are “changes in familiarity”. On the other hand, they look back over the past relationship and reconsider past events, and sometimes feel “regrets about the sibling relationship.” Thus [psychological changes] are caused, and they [build strong spiritual bonds with each other] and come to “consider each other”, their condition, their health, among others. This phase is the [Integration Phase], in which they start to establish a new sibling relationship, without being intermediated by their parents

### *Discussion*

Development of sibling relationships accompanied by the development of the family system is discussed from the perspective of the family life cycle, as suggested by Nakagama(2001). In the Family Phase, the firstborn children care for their younger siblings and are highly conscious of age differences. It is considered that this phase,

which continues from the birth of the second child to graduation from junior high school, or the university, is the longest phase. During this phase siblings show secondary sexual characteristics and differences in physique, which gradually decrease. In this phase, in which there are large physical differences and differences in abilities between siblings, older children might be compelled to think they have to do something for their younger siblings. However, they cannot immediately play the role of a big brother, or sister. Feeling burdened by the role, they gradually come to play it through communications with their parents. In previous studies, it was indicated that the firstborn children tend to control, or support their younger siblings in infancy and school age (Minnett, Vandell, & Santrock, 1983; Brody *et al.*, 1985). In this period, sibling relationships are considered to be rearing-centered. In the family life system, this period continues "from childbirth to the youngest child's entrance into elementary school," during which parents becomes adapted to parental roles, leading to the development of a system for child rearing. During the time in which parents become adapted to parental roles and communication patters between parents and children are developed, the firstborn children are learn and come to play the role of big brother or sister.

In the Independent Phase, differences in physiques and abilities become unremarkable. Siblings come to resemble peers, giving and receiving advice, in addition to competing with each other, and they develop a certain distance. This period is considered to range from the

time when secondary sex characteristics become apparent to marriage. Buhrmester & Furman (1990) suggested that sibling relationships gradually become equal from puberty to adolescence, and this idea is corroborated by this study. In the family life cycle, parental change, family members become individualized, and the boundary between family members also change. This period is considered to continue from the time when "children start going to elementary school" to the time when "children reach puberty or adolescence."

As a result of family members becoming individualized, siblings become able to keep an appropriate distance and interact with each other as equal individuals. In this phase, the position of firstborn children changes from being a big brother, or a big sisters to an being individuals. Also the content of communication changes at this time. On the other hand, communication between parents and children does not change so soon and as a result, occasionally; strong feelings of rebellion against parents might develop.

In the Relative Phase, the frequency of contact between siblings decreases because siblings must attend to their own jobs and family. This period is considered to range from when the time siblings get married to when they start to care for their parents. In the family life cycle, this phase corresponds to the period from "getting independent of the original family" to "uniting two families through marriage." Sibling relationships gradually change to interactions between the families,

which includes their spouses and children. White (2001) indicated that contacts between siblings decrease after adolescence until they reach middle age, which is natural because people usually have their own families after adolescence and siblings become relatives. On the other hand, conflicts are sometimes caused between a person's new family and the original family. Moreover, conflicts between parents and children also sometimes affect sibling relationships and the problem becomes more complicated because of the involvement of their families. Therefore, in this phase, it is important to maintain sibling relationships by taking the rules of new families of each sibling into consideration.

In the Care Phase, siblings, including their spouses keep in touch with each other in order to take care of their parents, and establish a system for their care. This phase continues from when caring for parents is initiated, until they die. In the family life cycle, it corresponds to the period of "children's becoming independent and the subsequent, family regression period," in which family members attend to their grand parents' aging and death. It is necessary to change family systems for caregiving and simultaneously, sibling relationship also have to change as a result of caregiving. If the spouses of siblings were cooperative, the cooperation and unity among siblings is facilitated. As Watanabe (2005) indicated, siblings become important members in care giving and in this phase, siblings construct a system for cooperating.

Finally, in the Integration Phase, siblings

look back over the past relationship and feel consideration for other siblings. This phase ranges between parents' death and siblings' death. In this period, a new sibling relationship that is not intermediated by parents is established. In the family life cycle, it corresponds to the "period of old family, i.e. period of family replacement," in which wisdom and experience that aged people have are utilized and the old are replaced by the next generation. Before this phase, interactions between siblings' families had been intermediated by parents. On the other hand, in this phase, they start to develop new sibling relationship unrelated to relationships with relatives and begin to perceive their siblings as individuals. This evaluation of relationships might result in psychological changes. White (2001) indicated that contacts between siblings increased after 70 years of age. As closeness between siblings increases, the frequency of contact also increases. Sometimes they have regrets concerning their distant relationship in the past, and summarize overall sibling relationship.

As described above, developmental transformations in sibling relationships are determined by changes in family relationships and rules, such as changes in the parent-child relationship, formation of relative relationships, and parents' death, among others. Sibling relationships are changed only by the development of individuals, but also by changes in relationships, and rules in the surrounding world. Sibling relationships could be easily affected by conflicts and problems

caused by people around them. On the other hand, the relationship might continue for a lifetime, if it changes appropriately. Therefore, it is important to maintain and establish good sibling relationships in different generations.

### *Future perspectives*

This study suggested the general process of developmental transformations in sibling relationships. It is suggested that future studies investigate each phase of sibling relationships in detail and the causes of increasing closeness and decreasing interactions should be determined. Furthermore, why sibling interactions increase in later life should be investigated to determine if there are any triggers of this behavior. This study did not examine gender differences, although certain gender differences were observed. For example, in the Relative Phase, women had common topics of conversation about childcare, whereas men rarely interacted with each other. In the future, findings related to each phase should be examined in more details by taking sex differences into consideration utilizing quantitative research methods. Especially, this research was conducted on the subjects of limited areas of Chugoku region and Tohoku region. However, depending on the degree of urbanization, it was pointed out that there were differences in marriage behaviors and communication attitudes between grandchildren's and grandparents' generations (Akazawa, Mizukami, & Kobayashi, 2009; Kitamura & Miyazaki, 2009). The data of this research were about the families of provincial

towns, but it was possible that their communications and family relationships may be different from the ones of other provincial towns or urban cities. It can be thought that these regional characteristics may be affecting the families and their sub-system sibling relationships more than a little. Therefore, the data of this research should be interpreted as one of the data to form hypothesis. In the future, it is required to present more generalizable results through quantitative research that covers larger areas.

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家族社会学的研究 東京：学文社.)

## **Longitudinal Study of the Stress Responses of Local Government Workers Who Have Been Impacted by a Natural Disaster**

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**ABSTRACT.** We conducted 4 times surveys starting from June 2011 and continuing through February 2013, in order to check up stress response of local government workers who suffered The Great East Japan Earthquake (Higashi Nihon Daishinsai) with K6 and Comprehensive Stress Response Inventory (CSI). Our study has three aims. First, we will organize the chronological pattern of stress responses. Second, we will examine how the initial disastrous condition and attributes of survey participants relate to the chronological pattern of subsequent stress responses. Third, we will examine how the current stress responses interplay with the chronological pattern of stress responses.

Result of this study show that (1) chronological patterns of stress response are classified into 8 clusters (no-stress response maintaining group, low-stress response maintaining group, low-stress response to no-stress response slow improvement group, middle-stress response to high-stress response slow deteriorated group, middle-stress response to low-stress response slow improvement group, low-stress response to no-stress response rapid improvement group, high-stress response to low-stress response rapid improvement group, severe-stress response maintaining group —13.55% of local government workers remained at a high level of stress 15 months after the earthquake), (2) damage of domicile and living outside their domiciles relate to stress response of local government workers, (3) two factors of CSI (stress response to a disaster and autonomic symptoms) relate with state at the outset of disaster and other two factors of CSI (anxiety / tense and displeasure / anger) relate with recent conditions. We mainly discussed two themes about point of attention in mental health care for local government workers at a natural disaster and points of attention in assessment of PTSD-like response.

**KEY WORDS:** Great East Japan Earthquake (Higashi Nihon Daishinsai), PTSD, local government workers, Comprehensive Stress Response Inventory

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### **Introduction**

This study is primarily designed to examine

the employees in the regions where the Great East Japan Earthquake (Higashi Nihon Daishinsai) and subsequent tsunamis caused a great impact of damage and destruction. Longitudinal surveys have been conducted 4 times over a total of two years and as a part of the health checkups which are regularly offered

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by the local government sectors to their employees. Because the format of the health checkup needed to be kept simple and concise, we took great consideration of the mental and physical stress that the participant may experience during our survey, and the survey was designed to minimize such stress.

The types of stressful conditions that are experienced by public servants in the locations impacted by the disaster are grouped into three categories as described below (Wakashima & Noguchi, 2013): (1) Public servants themselves were victims of the disaster: In the early time period following the earthquake and tsunami, some local government workers could not find their own family members, and yet they dedicated their time and effort to supporting their community and its residents. Some workers had lost their homes and family, and yet they served others who had been impacted by the disaster. However, it is considered that even though those service workers may have been mentally hurt, they preferred to continue their activities to serve others instead of becoming inactive and disheartened as victims of the disaster. (2) The increased workload due to the increased needs of victims and public expectations concerning the restoration of towns and cities: From the perspective of the long-term influence on the public servants, the increased workload is one of the most difficult and important issues. When the mental health of the local government workers is considered, the question of how quickly those workers will be able to achieve the restoration of the town while they also maintain the same amount of

workload as before the incident should be discussed. (3) The increase amount of complaints/concerns received from residents: Due to the consciousness of their professional responsibilities as public servants, there is the potential risk that local government workers may lose themselves in the significance in their jobs because of the constant complaints and demands that are continuously received from residents, and this may cause them to lose confidence in themselves.

Under the stressful conditions described above, local government workers have been playing a central role in the recovery and restoration of their towns. In this regard, the purpose of our study is to focus on those workers as our subjects and to examine their responses to stressors in following the occurrence of a natural disaster in chronological order. Our study is also aimed at clarifying several aspects.

First, we will organize the chronological pattern of stress responses. Second, we will examine how the initial disastrous condition and attributes of survey participants relate to the chronological pattern of subsequent stress responses. Third, we will examine how the current stress responses interplay with the chronological pattern of stress responses.

### ***Methods***

#### **1. Research participants and investigation time**

Our research participants are municipal government workers who serve at local city halls on the coast of the Tohoku region (the northeastern area of Honshu). The number of

the participants in each survey varies from 1,378 to 1,452 persons. We conducted our surveys four times starting from June 2011 (which was the year that the Great East Japan Earthquake occurred) and continuing through February 2013. Table 1, shown below, shows the number of participants for each survey, their gender and ages, and the dates that we conducted each survey.

Specific questions—whether or not the subjects were involved with disaster-related duties, the extent of damage to their domiciles, whether or not they experienced life without a domicile, and whether or not their family members were missing or dead—were considered to be constant and asked only once at the 1<sup>st</sup> investigation.

2. The content of our survey

The survey is composed of basic demographic questions including age, gender, job location and title, and whether or not participants would request to see mental health clinicians such as psychiatrists or clinical psychotherapists. In addition, the survey also

includes questions about the condition of participant’s workplace, the damage to their personal property, and their physical and mental health conditions.

1) Condition of Workplace (This portion of the survey was conducted only once at the 1<sup>st</sup> investigation.)

(1) Whether or not subjects were involved with disaster-related duties

1. Handling victims’ bodies and related operations
2. Handling complaints from residents
3. Others
4. No
5. More than one duty

(2) Whether or not subjects have worked overtime exceeding 100 hours.

(1. Yes 2. No)

(3) Communication with co-workers at their workplace

(1. Yes, regularly 2. Yes, occasionally 3. No, not at all)

2) Situation of personal damage caused by

	Date	Number of participants
<b>1st investigation</b>	June 2011	1452 (male:806, female:646) Mean of age :45.09
<b>2nd investigation</b>	October 2011	1414 (male:804, female:610) Mean of age :45.46
<b>3rd investigation</b>	June 2012	1387 (male:797, female:590) Mean of age:44.02
<b>4th investigation</b>	February 2013	1378 (male: 799, female:579) Mean of age:44.81

the disaster (This portion of the survey was conducted only once at the 1<sup>st</sup> investigation.)

(1) Damage to domicile

1. Completely collapsed
2. Half-collapsed/largely destroyed
3. Partially destroyed
4. Slightly damaged
5. No damage

(2) Whether or not subjects had the experience of living without a domicile

(e.g. staying at an evacuation shelter)

1. Yes I have but not now
2. Yes, I still live in an arranged situation
3. No, not at all

(3) Whether or not family members have been killed or missing.

(1. Yes 2. No)

3) Health condition (It was conducted from the first through the fourth investigations.)

(1) Physical condition

(1. Good 2. Neither good nor bad 3. Not so well 4. Bad)

(2) Sleep

(1. Very well 2. Well mostly 3. Poorly 4. Very poorly)

(3) Appetite

(1. Increased 2. Same as last time/before 3. Decreased)

(4) Change in the amount of alcohol beverage consumption

1. Increased
2. Same as last time/before
3. Decreased
4. Not consumption at all)

(5) Whether or not subjects have a chronic

disease and status of treatment

1. I managed to have continual treatment

2. Treatment was suspended in the past, but it has resumed

3. Treatment is still been suspended

4) Assessments of mental health condition

(1) K6 in the Japanese version (performed in the 1<sup>st</sup> through 4<sup>th</sup> investigations): We used the Japanese version of K6 that was originally created by Kessler, Andrews, Colpe *et al.* (2002) and designed for the purpose of screening for mental disorders and examining the severity of the disorder (Furukawa, Ono, Uda, & Nakane, 2003). The Japanese K6 is composed of six items and asks the subject to answer using five point scales (0: not at all through 4: always).

(2) CSI (Comprehensive Stress Response Inventory) (performed at the 4<sup>th</sup> investigation): CSI was developed by Asai, Morikawa, Hiraizumi, Usami, and Wakashima (2013) in order to easily detect and simultaneously differentiate a type of disaster-specific stress and a type of general stress. It is a comprehensible assessment to measure overall stress responses. The CSI identifies four factors of stress response and is composed of 25 items in total. Three factors are each categorized into “anxiety/tense,” “displeasure/anger,” and “autonomic symptoms” and considered to describe as the general-stress response. The other factor is considered as a “specific stress response to a disaster”. Symptoms for the factor include flashbacks of intrusive memories, avoidance of activities that stimulate the

traumatic event, and re-experiencing the trauma.

Furthermore, the CSI examines one's general-stress response by excluding the specific stress response to a disaster and measuring three other factors. As for examination of PTSD and alike, it includes all four stress factors (the sum of the four factors). Particularly in this study, we presupposed the Great East Japan Earthquake as the specific disaster for the assessment of the specific stress response and asked each item in four point scales starting from the lowest scale, "1: Never," to the highest scale, "4: Most of the time." Likewise, in terms of the general stress response, we asked participants about their observed symptoms during the last 30 days, and each question was scaled from "1: Never" to "4" Most of the time."

### 3. Scoring of variables

This section describes the scoring of variables. However, it excludes the items that we did not include in our investigation of study subjects, such as physical condition, appetite, the amount of alcohol beverage consumption, and the presence of chronic disease and condition for its treatment. In regard to the following items—experience of disaster-related duties, overtime exceeding 100 hours of work, the degree of domicile damage, arrangements for living outside the home, whether or not family members are missing or dead, and gender, we used the response categories of each question as categorical variables. On the other hand, regarding questions involving

communication with co-workers (1 item), sleep (1 item), K6 in the Japanese version (6 items), CSI (8 items of specific stress response to a disaster, 9 items of anxiety/tense factors, 4 items of displeasure/anger factors, 4 items of autonomic symptom factors, for a total of 25 items), rating scales values and their total values were chosen for scoring. These quantitative data are set such that a higher score indicate a worse condition of the participant.

### *Results*

For the purpose of organizing the stress response patterns in a chronological order, we placed the values of "communication with co-workers," "asleep condition," and "scores of K6" that were collected from the 1st investigation through the 3rd investigation into categorical variables and conducted a cluster analysis in accordance with the Ward method. The number of subjects from the 1<sup>st</sup> investigation through 3<sup>rd</sup> investigation was 952 persons and there were no missing values during the series of investigations. Because we valued perspective interpretability, a structure of 8 clusters was established for this analysis.

Each cluster for analysis is termed as follows: 1) No-stress response maintaining group (n=291), 2) Low-stress response maintaining group (n=168), 3) Low-stress response to no-stress response slow improvement group (n=130), 4) Middle-stress response to high-stress response slow deteriorated group (n=87), 5) Middle-stress response to low-stress response slow improvement group (n=76), 6) Low-stress

response to no-stress response rapid improvement group (n=92), 7) High-stress response to low stress response rapid improvement group (n=66), and 8) Severe-stress response maintaining group (n=42). In order to explain the foundation of naming each cluster, particular features of each

cluster are described in Table 2, and descriptive statistics are shown from Tables 3 through Table 5, followed by the profile of each cluster in Figure 1.

In regard to naming clusters, we referred classification of Wakashima, Kozuka, Noguchi *et al.* (2012). In this study, we took score of K6

Table2. Feature of Each Cluster

Cluster	Number of people	Feature
No-stress response maintaining group	291	On the whole, this cluster is better than other clusters from 1st investigation through 3rd investigation.
Low-stress response maintaining group	168	Stress response had deteriorated from 2nd investigation to 3rd investigation. But, on the whole, this cluster not has much of a problem.
Low-stress response to no-stress response slow improvement group	130	This cluster's problems slight-to-moderate at the outset of disaster, but these problems improved from 2nd investigation to 3rd investigation.
Middle-stress response to high-stress response slow deteriorated group	87	Asleep condition is bad from 1st investigation through 3rd investigation, and stress response had deteriorated from 2nd investigation to 3rd investigation in this cluster.
Middle-stress response to low-stress response slow improvement group	76	This cluster had moderate problems at the outset of disaster, but problems improved from 2nd investigation to 3rd investigation.
Low-stress response to no-stress response rapid improvement group	92	This cluster had slight-to-moderate problems at the outset of disaster, but these problems had improved at 2nd investigation.
High-stress response to low stress response rapid improvement group	66	This cluster had severe problems at the outset of disaster. Improvement in the problem of stress response is remarkable. Problems of asleep condition and communication improved too at 2nd investigation.
Severe-stress response maintaining group	42	This cluster is worst in all clusters with respect to all indicators of condition of health.
Total	952	

Table3. Descriptive Statistics about Asleep Condition

	Asleep condition①		Asleep condition②		Asleep condition③	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
No-stress response maintaining group	1.80	.55	1.67	.53	1.73	.55
Low-stress response maintaining group	2.14	.56	2.02	.60	2.15	.53
Low-stress response to no- stress response slow improvement group	2.02	.53	2.09	.49	1.86	.53
Middle-stress response to high-stress response slow deteriorated	2.34	.59	2.25	.61	2.46	.66
Middle-stress response to low-stress response slow improvement group	2.47	.62	2.50	.62	2.24	.46
Low-stress response to no-stress response rapid improvement group	2.13	.63	1.83	.51	1.82	.47
High-stress response to low stress response rapid improvement group	2.32	.66	1.95	.59	2.00	.46
Severe-stress response maintaining group	2.76	.79	2.74	.77	2.60	.77
Total	2.10	.64	1.99	.64	1.99	.61

Note: Each numbers framed by circle indicate the time of investigation.

Table4. Descriptive Statistics about K6

	K6①		K6②		K6③	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
No-stress response maintaining group	2.43	1.76	1.31	1.35	1.58	1.68
Low-stress response maintaining group	6.24	2.31	4.67	2.50	7.41	2.18
Low-stress response to no- stress response slow improvement group	5.42	2.34	6.48	1.37	2.97	1.63
Middle-stress response to high-stress response slow deteriorated	10.16	2.82	9.45	2.19	12.69	4.14
Middle-stress response to low-stress response slow improvement group	9.55	2.83	12.45	3.07	6.55	3.07
Low-stress response to no-stress response rapid improvement group	8.80	2.10	2.86	1.57	1.78	1.73
High-stress response to low stress response rapid improvement group	14.03	3.46	6.61	2.15	5.27	3.21
Severe-stress response maintaining group	17.40	3.89	16.43	3.68	14.26	4.60
Total	6.86	4.76	5.43	4.60	5.05	4.67

Note: Each numbers framed by circle indicate the time of investigation.

as the criterion of severity of stress response. A range of 0 to 3 is defined as “no-stress response”, 4 to 9 is defined as “low-stress response”, 10 to 12 is defined as “middle-stress response”, and not lower than 13 is defined as “high-stress response” or “severe-stress response”. Initial expression of each cluster mentions degree of stress response at 1<sup>st</sup> investigation. Depending on changes over time, we added to corresponding words (maintaining, improvement, or deteriorated). Furthermore, “rapid” and “slow” indicate the moment when severity of stress response changed. “Rapid” means that changes resulted between 1<sup>st</sup> investigation and 2<sup>nd</sup> investigation. “Slow” means that changes resulted between 2<sup>nd</sup> investigation and 3<sup>rd</sup> investigation.

Next, we conducted a chi-square test for those clusters regarding conditions of the disaster and chronological patterns. The purpose of this test is to examine how the initial

disaster condition and attributes of the subjects (i.e. involvement of disaster-related duties, more than 100 hours of overtime work, experiences of domicile damage and outside domicile life, dead or missing person(s) in the family, and gender) are related with their subsequent stress responses in chronological patterns.

As a result, no statistical significance was found in the aspects of involvement of disaster-related duties ( $\chi^2 = 38.01$ ,  $df = 28$ , *n.s.*), more than 100 hours of overtime work ( $\chi^2 = 14.06$ ,  $df = 7$ , *n.s.*), and gender ( $\chi^2 = 8.25$ ,  $df = 7$ , *n.s.*). On the other hand, significant differences were found in the variables of damage to a domicile ( $\chi^2 = 51.39$ ,  $df = 28$ ,  $p < .01$ ), experiences of life outside a domicile ( $\chi^2 = 40.44$ ,  $df = 14$ ,  $p < .01$ ), and having dead or missing person(s) in the family ( $\chi^2 = 18.58$ ,  $df = 7$ ,  $p < .01$ ). In accordance with these results, we also conducted residual analyses for the

Table5. Descriptive Statistics about Communication with Co-worker

	COM①		COM②		COM③	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
No-stress response maintaining group	1.78	.49	1.79	.46	1.54	.51
Low-stress response maintaining group	1.90	.46	1.88	.37	1.80	.50
Low-stress response to no-stress response slow improvement group	1.88	.45	1.92	.41	1.58	.49
Middle-stress response to high-stress response slow deteriorated	1.97	.59	2.03	.61	1.91	.45
Middle-stress response to low-stress response slow improvement group	1.87	.53	1.96	.47	1.61	.52
Low-stress response to no-stress response rapid improvement group	1.98	.44	1.85	.42	1.50	.52
High-stress response to low stress response rapid improvement group	1.94	.46	1.85	.40	1.70	.55
Severe-stress response maintaining group	1.98	.64	2.07	.56	1.98	.64
Total	1.88	.49	1.88	.44	1.66	.53

Note: Each numbers framed by circle indicate the time of investigation. "COM" indicate communication with co-worker.

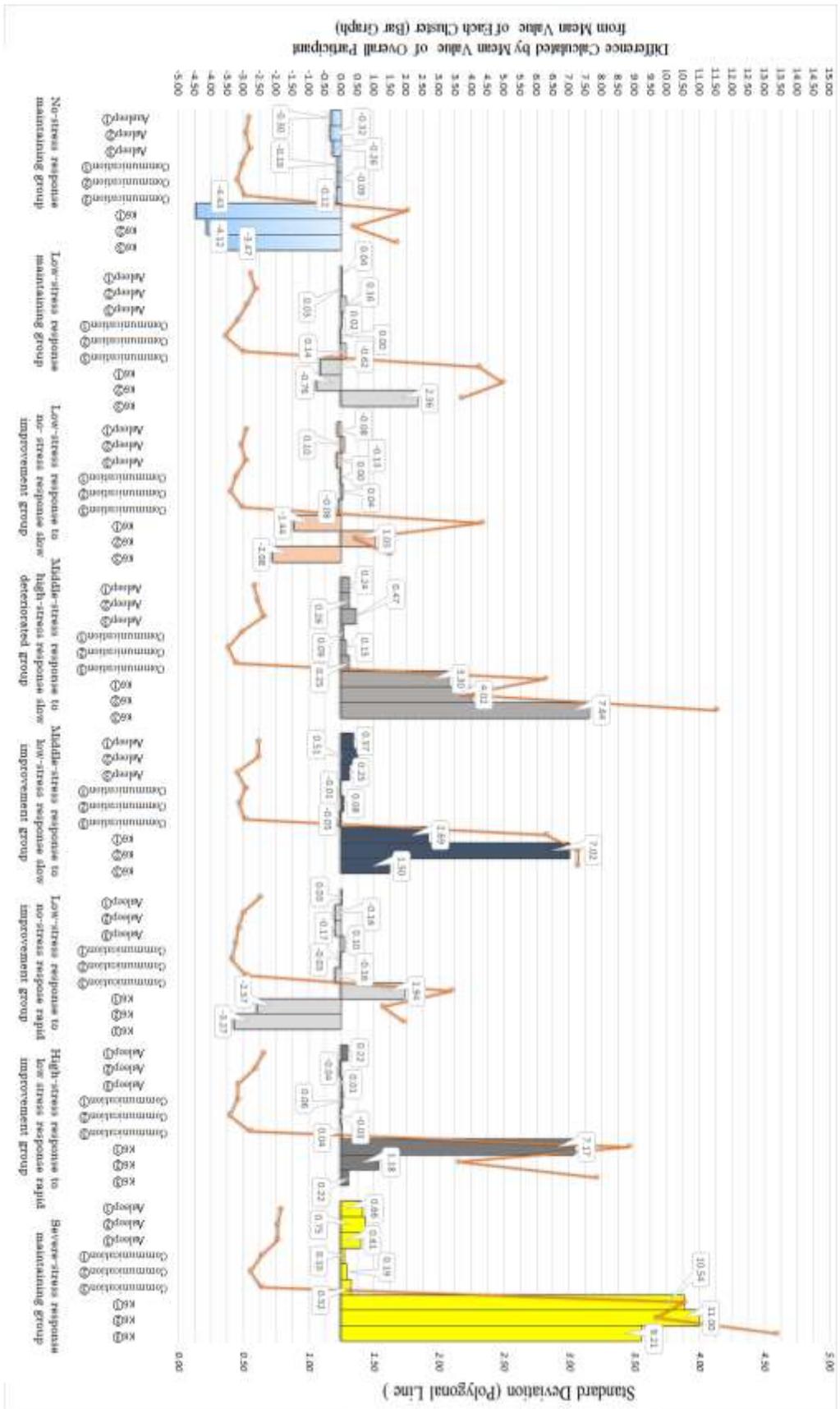


Figure 1. Profile of Each Cluster

variables that statistical significance was observed. The results of residual analyses, which are itemized in damage of a domicile, experience of life outside the domicile, and having dead or missing person(s) in the family are indicated in Tables 6 through 11.

According to the result of residual analysis based on a cross-tabulation table between the cluster of the damage of domiciles and the cluster of chronological patterns, the subjects whose domiciles were completely destroyed have the highest probability to be placed in the

Table6. Result of Residual Analysis about Damage of Domicile ( $n = 944$ )

Cluster		Complete collapse	Half collapse	Partially destroy	Slightly damage	No damage	$\chi^2$
No stress response maintaining group	Frequency	50	39	98	74	27	
	Expected frequency	68.95	44.85	89.08	63.76	21.36	
	<i>Adj.residual</i>	-3.14	-1.14	1.36	1.74	1.52	
Low-stress response maintaining group	Frequency	35	25	54	40	13	
	Expected frequency	39.98	26.01	51.66	36.97	12.38	
	<i>Adj.residual</i>	-1.00	-.24	.43	.62	.20	
Low-stress response to no stress response slow improvement group	Frequency	33	28	36	22	9	
	Expected frequency	30.64	19.93	39.59	28.34	9.49	
	<i>Adj.residual</i>	.52	2.12	-.74	-1.45	-.18	
Middle-stress response to high-stress response slow deteriorated group	Frequency	29	13	22	19	4	
	Expected frequency	20.83	13.55	26.91	19.26	6.45	
	<i>Adj.residual</i>	2.15	-0.17	-1.20	-0.07	-1.05	
Middle-stress response to low-stress response slow improvement group	Frequency	18	8	27	18	4	
	Expected frequency	17.96	11.68	23.20	16.60	5.56	51.39 (28)**
	<i>Adj.residual</i>	.01	-1.22	.99	.40	-.72	
Low-stress response to no stress response rapid improvement group	Frequency	18	16	31	19	7	
	Expected frequency	21.79	14.17	28.15	20.15	6.75	
	<i>Adj.residual</i>	-.98	.56	.68	-.30	.11	
High-stress response to low stress response rapid improvement group	Frequency	26	6	17	11	6	
	Expected frequency	15.80	10.28	20.42	14.61	4.89	
	<i>Adj.residual</i>	3.05	-1.51	-.94	-1.11	.54	
Severe-stress response maintaining group	Frequency	17	12	7	6	0	
	Expected frequency	10.06	6.54	12.99	9.30	3.11	
	<i>Adj.residual</i>	2.57	2.38	-2.05	-1.25	-1.88	
Total	Frequency	226	147	292	209	70	
	Expected frequency	226.0	147.0	292.0	209.0	70.0	

\*\*  $p < .01$

Table7. Abstract about Residual Analysis on Damage to Domicile (n =944)

Complete collapse	Great frequency	Middle-stress response to high-stress response slow deteriorated group * High-stress response to low stress response rapid improvement group ** Severe-stress response maintaining group *
	Low frequency	No-stress response maintaining group **
Half collapse	Great frequency	Low-stress response to no- stress response slow improvement group * Severe-stress response maintaining group *
	Low frequency	Not available
Partially destroy	Great frequency	Not available
	Low frequency	Severe-stress response maintaining group *
Slightly damage	Great frequency	Not available
	Low frequency	Not available
No damage	Great frequency	Not available
	Low frequency	Not available

\*p < .05, \*\*p < .01

Table8. Result of Residual Analysis about Experience of Outside Domicile Life (n =919)

Cluster		In past days	Until 1st investigation	Never	$\chi^2$
No-stress response maintaining group	Frequency	95	29	154	40.44 (14)**
	Expected frequency	110.41	36.91	130.68	
	Adj.residual	-2.26	-1.67	3.36	
Low-stress response maintaining group	Frequency	55	20	87	
	Expected frequency	64.34	21.51	76.15	
	Adj.residual	-1.65	-0.38	1.88	
Low-stress response to no- stress response slow improvement group	Frequency	54	14	57	
	Expected frequency	49.65	16.59	58.76	
	Adj.residual	0.86	-0.74	-0.34	
Middle-stress response to high-stress response slow deteriorated group	Frequency	35	20	31	
	Expected frequency	34.16	11.42	40.43	
	Adj.residual	0.20	2.87	-2.14	
Middle-stress response to low-stress response slow improvement group	Frequency	35	7	32	
	Expected frequency	29.39	9.82	34.79	
	Adj.residual	1.39	-1.01	-0.68	
Low-stress response to no-stress response rapid improvement group	Frequency	45	8	36	
	Expected frequency	35.35	11.82	41.84	
	Adj.residual	2.20	-1.25	-1.30	
High-stress response to low stress response rapid improvement group	Frequency	30	13	20	
	Expected frequency	25.02	8.36	29.61	
	Adj.residual	1.33	1.78	-2.51	
Severe-stress response maintaining group	Frequency	16	11	15	
	Expected frequency	16.68	5.58	19.74	
	Adj.residual	-0.22	2.53	-1.50	
Total	Frequency	365	122	432	
	Expected frequency	365.0	122.0	432.0	

\*\*p < .01

Table9. Abstract about Residual Analysis on Experience of Outside Domicile Life ( $n=919$ )

In past days	Great frequency	Low-stress response to no-stress response rapid improvement group*
	Low frequency	No-stress response maintaining group *
Until 1st investigation	Great frequency	Middle-stress response to high-stress response slow deteriorated group ** Severe-stress response maintaining group *
	Low frequency	Not available
Never	Great frequency	No-stress response maintaining group **
	Low frequency	Middle-stress response to high-stress response slow deteriorated group* High-stress response to low stress response rapid improvement group*

\* $p < .05$ , \*\* $p < .01$ Table10. Result of Residual Analysis about Existence or Non-existence of The Dead / Missing Person in Family ( $n=937$ )

Cluster		There is	There is not	$\chi^2$
No-stress response maintaining group	Frequency	11	274	18.58 (7)**
	Expected frequency	25.85	259.15	
	<i>Adj.residual</i>	-3.67	3.67	
Low-stress response maintaining group	Frequency	19	145	
	Expected frequency	14.88	149.12	
	<i>Adj.residual</i>	1.23	-1.23	
Low-stress response to no-stress response slow improvement group	Frequency	14	116	
	Expected frequency	11.79	118.21	
	<i>Adj.residual</i>	0.73	-0.73	
Middle-stress response to high-stress response slow deteriorated group	Frequency	10	74	
	Expected frequency	7.62	76.38	
	<i>Adj.residual</i>	0.95	-0.95	
Middle-stress response to low-stress response slow improvement group	Frequency	7	68	
	Expected frequency	6.80	68.20	
	<i>Adj.residual</i>	0.08	-0.08	
Low-stress response to no-stress response rapid improvement group	Frequency	13	78	
	Expected frequency	8.26	82.74	
	<i>Adj.residual</i>	1.82	-1.82	
High-stress response to low stress response rapid improvement group	Frequency	4	62	
	Expected frequency	5.99	60.01	
	<i>Adj.residual</i>	-0.88	0.88	
Severe-stress response maintaining group	Frequency	7	35	
	Expected frequency	3.81	38.19	
	<i>Adj.residual</i>	1.75	-1.75	
Total	Frequency	85	852	
	Expected frequency	85.0	852.0	
	<i>Adj.residual</i>			

\*\* $p < .01$

following groups: the middle-stress response to high-stress response slow deteriorated group ( $p<.05$ ), high-stress response to low stress response rapid improvement group ( $p<.01$ ), and severe-stress response maintaining group ( $p<.05$ ). On the other hand, the subjects whose domiciles were significantly damaged are less likely to be in the no-stress response maintaining group ( $p<.01$ ), while the subjects who experienced their domiciles were half-collapsed or largely destroyed have the likelihood of belonging to the low-stress response to no-stress response slow improvement group ( $p<.05$ ) and the severe-stress response maintaining group ( $p<.05$ ). Furthermore, the subjects whose domiciles were partially destroyed are less likely to be in the severe-stress response maintaining group ( $p<.05$ ) while others whose domiciles were either slightly damaged or no damage did not indicate any statistical significance.

According to the result of residual analysis based on a cross-tabulation table between the cluster of experience of life outside a domicile and the cluster of chronological patterns, the subjects who had experienced living outside their domiciles have the most likelihood of

being in the low-stress response to no-stress response rapid improvement group ( $p<.05$ ) and the least likelihood of being in the no-stress response maintaining group ( $p<.05$ ). Meanwhile, the subjects who still lived outside their domiciles when the 1<sup>st</sup> investigation took place are likely to be in the middle-stress response to high-stress response slow deteriorated group ( $p<.01$ ), and the severe-stress response maintaining group ( $p<.05$ ). On the other hand, those who never experienced living outside their domiciles are most likely to belong to the no-stress response maintaining group ( $p<.01$ ) and least likely to belong to the middle-stress response to high-stress response slow deteriorated group ( $p<.05$ ) or the high-stress response to low stress response rapid improvement group ( $p<.05$ ).

According to the residual analysis based on a cross-tabulation table between the cluster of having/not having missing or dead person(s) in the family and the cluster of chronological patterns, we found that the no-stress response maintaining group is mainly composed of the respondents who have few family members that are deceased or missing ( $p<.01$ ) or have nobody in the family who is deceased or missing ( $p<.01$ ).

Table11. Abstract about Residual Analysis on Existence or Non-existence of The Dead / Missing Person in Family ( $n =937$ )

There is	Great frequency	Not available
	Low frequency	No-stress response maintaining group **
There is not	Great frequency	No-stress response maintaining group **
	Low frequency	Not available

Table 12. Descriptive Statistics about CSI and K6 (Mean of Rank)

Cluster	No-stress response maintaining group	Low-stress response maintaining group	Low-stress response to no stress response slow improvement group	Middle-stress response to high- stress response slow deteriorated group	Middle-stress response to low- stress response slow improvement group	Low-stress response to no- stress response rapid improvement group	High-stress response to low stress response rapid improvement group	Severe-stress response maintaining group
<i>n</i>	240	149	118	70	67	80	55	29
K6④	219.66	502.89	380.14	641.69	553.6	302.53	492.63	724.91
Specific stress response to a disaster	275.16	440.67	402.33	556.42	515.04	368.93	493.35	605.36
Anxiety / tense	261.57	481.25	390.72	608.29	486.8	342.88	425.94	696.41
Displeasure / anger	277.87	483.78	401.37	577.83	447.85	346.31	437.18	637.91
Autonomic symptom	287.51	459.14	375.59	537.89	510.07	361.54	461.97	653.19
General stress response	252.63	491.68	391.35	608.24	489.81	339.36	443.95	682.91
Sum of four factors	215.89	484.99	366.63	607.65	503.38	343.17	467.45	666.6

Note: The number framed by circle indicate the time of investigation. "General stress response" means sum of "Anxiety / tense", "Displeasure / anger" and "Autonomic symptom".

Lastly, a Kruskal-Wallis test was performed involving dependent variables—the scores of the K6 from the 4<sup>th</sup> investigation, scores of the CSI (anxiety/tense, displeasure/anger, and autonomic symptoms, the sum of these three factors, specific stress response to the disaster, and the sum of all four factors). The purpose of this test was to identify how the chronological patterns of stress in the past are correlated with the current stress condition. The number of the subjects that were suitable for this test is 808, and there were no missing values in all dependent variables.

The test result indicated that the effect of clusters was statistically significant in all dependent variables: K6 at the time of the 4<sup>th</sup>

investigation ( $\chi^2 = 359.96, df = 7, p <.01$ ), anxiety/tense ( $\chi^2 = 223.42, df = 7, p <.01$ ), displeasure/anger ( $\chi^2 = 177.97, df = 7, p <.01$ ), and autonomic symptoms ( $\chi^2 = 156.87, df = 7, p <.01$ ), the sum of the above three factors ( $\chi^2 = 235.59, df = 7, p <.01$ ), specific stress response to the disaster ( $\chi^2 = 159.50, df = 7, p <.01$ ), and the sum of all four factors ( $\chi^2 = 240.68, df = 7, p <.01$ ).

In this regard, we conducted multiple comparisons of those dependent variables in accordance with the Mann-Whitney U-test (the Type I error rate was 5%). Table 12 shows the descriptive statistical results about stress among the clusters of CSI and K6. Next, the multiple comparison data are shown in Table 13 through

Table13. Result of Multiple Comparison about K6④

Cluster	Number of people	Mean of rank	Multiple comparison
No-stress response maintaining group (C1)	240	219.66	
Low-stress response maintaining group (C2)	149	502.89	
Low-stress response to no-stress response slow improvement group (C3)	118	380.14	
Middle-stress response to high-stress response slow deteriorated group (C4)	70	641.69	C1 < C6, C3 < C7, C2, C5, C4 < C8
K6④ Middle-stress response to low-stress response slow improvement group (C5)	67	553.6	Note: C7, C2 < C4
Low-stress response to no-stress response rapid improvement group (C6)	80	302.53	
High-stress response to low stress response rapid improvement group (C7)	55	492.63	
Severe-stress response maintaining group (C8)	29	724.91	
Total	808		

Note: The number framed by circle indicate the time of investigation.

Table 19. Each cluster of stress response will be expediently described in abbreviation as follows: C1 as no-stress response maintaining group, C2 as low-stress response maintaining group, C3 as low-stress response to no-stress response slow improvement group, C4 as middle-stress response to high-stress response slow deteriorated group, C5 as middle-stress response to low-stress response slow improvement group, C6 as low-stress response to no-stress response rapid improvement group, C7 as high-stress response to low stress response rapid improvement group, and C8 as severe-stress response maintaining group.

According to multiple comparisons involving

K6 scores at the 4<sup>th</sup> investigation, the no-stress response maintaining group (C1) significantly has the lowest mean value among all the stress response clusters. Also, the low-stress response to no-stress response rapid improvement group (C6) and the low-stress response to no-stress response slow improvement group (C3) had significantly lower mean values than the high-stress response to low stress response rapid improvement group (C7), the low-stress response maintaining group (C2), the middle-stress response to low-stress response slow improvement group (C5), the middle-stress response to high-stress response slow deteriorated group (C4), and the

Table14. Result of Multiple Comparison about Specific Stress Response to a Disaster

Cluster	Number of people	Mean of rank	Multiple comparison
No-stress response maintaining group (C1)	240	275.16	
Low-stress response maintaining group (C2)	149	440.67	
Low-stress response to no-stress response slow improvement group (C3)	118	402.33	
Middle-stress response to high-stress response slow deteriorated group (C4)	70	556.42	C1 < C6, C3, C2, C7, C5 < C4, C8
Middle-stress response to low-stress response slow improvement group (C5)	67	515.04	Note: C6 < C7, C5
Low-stress response to no-stress response rapid improvement group (C6)	80	368.93	
High-stress response to low stress response rapid improvement group (C7)	55	493.35	
Severe-stress response maintaining group (C8)	29	605.36	
Total	808		

severe-stress response maintaining group (C8). Furthermore, the mean values of the high-stress response to low stress response rapid improvement group (C7), the low-stress response maintaining group (C2), the middle-stress response to low-stress response slow improvement group (C5), and the middle-stress response to high-stress response slow deteriorated group (C4) are significantly lower than that of the severe-stress response maintaining group (C8). In particular, C7 and C2 have significantly lower mean values than that of C4.

According to multiple comparisons involving specific stress response to a disaster in CSI, the no-stress response maintaining group (C1)

significantly has the lowest mean value across all stress response clusters. Also, the low-stress response to no-stress response rapid improvement group (C6), the low-stress response to no-stress response slow improvement group (C3), the low-stress response maintaining group (C2), the high-stress response to low stress response rapid improvement group (C7), and the middle-stress response to low-stress response slow improvement group (C5) have significantly lower mean values than the middle-stress response to high-stress response slow deteriorated group (C4) and the severe-stress response maintaining group (C8). In particular, C6 has a significantly low mean

Table15. Result of Multiple Comparison about Anxiety / tense

Cluster	Number of people	Mean of rank	Multiple comparison
No-stress response maintaining group (C1)	240	261.57	
Low-stress response maintaining group (C2)	149	481.25	
Low-stress response to no-stress response slow improvement group (C3)	118	390.72	
Middle-stress response to high-stress response slow deteriorated group (C4)	70	608.29	C1,C6,C3,C7,C2,C5, < C4,C8
Middle-stress response to low-stress response slow improvement group (C5)	67	486.8	Note: C1 < C3,C7,C2,C5 C6,C3 < C2,C5
Low-stress response to no-stress response rapid improvement group (C6)	80	342.88	
High-stress response to low stress response rapid improvement group (C7)	55	425.94	
Severe-stress response maintaining group (C8)	29	696.41	
Total	808		

value in comparison to C7 and C5.

From the multiple comparisons involving anxiety/tense in CSI, the mean values of the no-stress response maintaining group (C1), the low-stress response to no-stress response rapid improvement group (C6), the low-stress response to no-stress response slow improvement group (C3), the high-stress response to low stress response rapid improvement group (C7), the low-stress response maintaining group (C2), and the middle-stress response to low-stress response slow improvement group (C5) are significantly low in comparison to the mean values of the middle-stress response to high-stress response

slow deteriorated group (C4) and the severe-stress response maintaining group (C8). In particular, C1 indicates the significantly lower mean value than C3, C7, C2, and C5. Furthermore, the mean values of C6 and C3 are also significantly lower than C2 and C5.

In terms of multiple comparisons involving displeasure/anger in CSI, the mean values of the no-stress response maintaining group (C1), the low-stress response to no-stress response rapid improvement group (C6), the low-stress response to no-stress response slow improvement group (C3), the high-stress response to low stress response rapid improvement group (C7), the middle-stress

Table16. Result of Multiple Comparison about Displeasure / anger

Cluster	Number of people	Mean of rank	Multiple comparison
No-stress response maintaining group (C1)	240	277.87	
Low-stress response maintaining group (C2)	149	483.78	
Low-stress response to no-stress response slow improvement group (C3)	118	401.37	
Middle-stress response to high-stress response slow deteriorated group (C4)	70	577.83	C1, C6, C3, C7, C5, C2 < C4, C8
Middle-stress response to low-stress response slow improvement group (C5)	67	447.85	Note: C1 < C3, C7, C5, C2 C6, C3 < C2
Low-stress response to no-stress response rapid improvement group (C6)	80	346.31	
High-stress response to low stress response rapid improvement group (C7)	55	437.18	
Severe-stress response maintaining group (C8)	29	637.91	
Total	808		

response to low-stress response slow improvement group (C5), and the low-stress response maintaining group (C2) are significantly low in comparison to the mean values of the middle-stress response to high-stress response slow deteriorated group (C4) and the severe-stress response maintaining group (C8). In particular, C1 indicates a significantly lower mean value than C3, C7, C5, and C2. Furthermore, the mean values of C6 and C3 are also significantly lower than the mean values of C2.

From the multiple comparisons regarding autonomic symptoms in CSI, the mean values of the no-stress response maintaining group

(C1), the low-stress response to no-stress response rapid improvement group (C6), and the low-stress response to no-stress response slow improvement group (C3) are significantly low in comparison to the mean values of the low-stress response maintaining group (C2), the high-stress response to low stress response rapid improvement group (C7), the middle-stress response to low-stress response slow improvement group (C5), the middle-stress response to high-stress response slow deteriorated group (C4), and the severe-stress response maintaining group (C8). In particular, the mean value of C1 is significantly lower than that of C3. Similarly,

Tbale17. Result of Multiple Comparison about Autonomic symptom

Cluster	Number of people	Mean of rank	Multiple comparison
No-stress response maintaining group (C1)	240	287.51	
Low-stress response maintaining group (C2)	149	459.14	
Low-stress response to no-stress response slow improvement group (C3)	118	375.59	
Middle-stress response to high-stress response slow deteriorated group (C4)	70	537.89	C1,C6,C3<C2,C7,C5,C4,C8
Middle-stress response to low-stress response slow improvement group (C5)	67	510.07	Note: C1<C3 C2,C7,C5<C8
Low-stress response to no-stress response rapid improvement group (C6)	80	361.54	
High-stress response to low stress response rapid improvement group (C7)	55	461.97	
Severe-stress response maintaining group (C8)	29	653.19	
Total	808		

C2, C7, and C5 each have a significantly lower value than C8.

From the multiple comparisons in the sum of three stress response factors regarding the general-stress response of the CSI, the no-stress response maintaining group (C1) indicates the lowest mean value across all clusters. Also, the low-stress response to no-stress response rapid improvement group (C6), the low-stress response to no-stress response slow improvement group (C3), the high-stress response to low stress response rapid improvement group (C7), the middle-stress response to low-stress response slow improvement group (C5), and the low-stress

response maintaining group (C2) have significantly lower mean values than the middle-stress response to high-stress response slow deteriorated group (C4) and the severe-stress response maintaining group (C8). In particular, the mean values of C6 and C3 are significantly lower than those of C5, and C2.

From the multiple comparisons in the sum of all four stress response factors in CSI, the no-stress response maintaining group (C1) indicates the lowest mean value across all clusters. In particular, the low-stress response to no-stress response rapid improvement group (C6) has a significantly lower mean value than those of the high-stress response to low stress

Table18. Result of Multiple Comparison about General-stress response

Cluster	Number of people	Mean of rank	Multiple comparison
No-stress response maintaining group (C1)	240	252.63	
Low-stress response maintaining group (C2)	149	491.68	
Low-stress response to no-stress response slow improvement group (C3)	118	391.35	
Middle-stress response to high-stress response slow deteriorated group (C4)	70	608.24	C1 < C6, C3, C7, C5, C2 < C4, C8
Middle-stress response to low-stress response slow improvement group (C5)	67	489.81	Note: C6, C3 < C5, C2
Low-stress response to no-stress response rapid improvement group (C6)	80	339.36	
High-stress response to low stress response rapid improvement group (C7)	55	443.95	
Severe-stress response maintaining group (C8)	29	682.91	
Total	808		

response rapid improvement group (C7), the low-stress response maintaining group (C2), the middle-stress response to low-stress response slow improvement group (C5), the middle-stress response to high-stress response slow deteriorated group (C4), and the severe-stress response maintaining group (C8). The mean value of the low-stress response to no-stress response slow improvement group (C3) is significantly lower than the mean values of C2, C5, C4, and C8. Similarly, the mean value of the high-stress response to low stress response rapid improvement group (C7) is significantly lower than the mean values C4 and C8.

**Discussion**

The main purpose of this study is to focus on local government workers who perform the central roles for recovery and restoration work after the Great East Japan Earthquake and to investigate the different types of stress that they reported in chronological order. In particular, we classified each stress type into chronological patterns based on survey answers provided by the public servants and examined how the initial condition of their disaster experiences and their attributes are related to the subsequent patterns of stress. Furthermore, the correlation between the participants' current

Table19. Result of Multiple Comparison about Sum of four factors

Cluster	Number of people	Mean of rank	Multiple comparison
No-stress response maintaining group (C1)	240	245.89	
Low-stress response maintaining group (C2)	149	484.99	
Low-stress response to no-stress response slow improvement group (C3)	118	396.63	
Middle-stress response to high-stress response slow deteriorated group (C4)	70	607.65	C1 < C6, C3, C7, C2, C5, C4, C8
Middle-stress response to low-stress response slow improvement group (C5)	67	503.38	Note: C6 < C7, C2, C5, C4, C8 C3 < C2, C5, C4, C8 C7 < C4, C8
Low-stress response to no-stress response rapid improvement group (C6)	80	343.17	
High-stress response to low stress response rapid improvement group (C7)	55	467.45	
Severe-stress response maintaining group (C8)	29	666.6	
<b>Total</b>	<b>808</b>		

observed stress at each point and the chronological pattern of stress is also thoroughly investigated.

The first objective of this study, the classification of chronological patterns of stress, will be discussed. We initially explain the reason for performing a cluster analysis of K6 along with two additional variables. K6 is an instrument of stress response scales, consisting of 6 items, and it was originally developed in consideration of the psychological impacts on the public servants who have been struck by natural disaster. However, the efficiency of K6 was questioned due to concern that only limited types of stress responses could possibly be measured, and because of this concern, an extra two variables— Asleep condition and communication with co-workers—were added to the original K6.

Our test results show that scores on the items examining sleep and communication with co-workers and the scores of the original K6 were almost comparable. Especially, asleep condition was identified as an important variable for measurement of one's stress level. Chronological patterns of stress involving those variables are classified into 8 clusters. The rate of each cluster is as follows: 30.57% no-stress response maintaining group; 17.65% low-stress response maintaining group; 13.66% low-stress response to no-stress response slow improvement group; 9.14% middle-stress response to high-stress response slow deteriorated group; 7.98% middle-stress response to low-stress response slow improvement group; 9.66% low-stress response

to no-stress response rapid improvement group; 6.93% high-stress response to low stress response rapid improvement group; and 4.41% severe-stress response maintaining group. In particular, two groups—the middle-stress response to high-stress response slow deteriorated group (9.14%) and the severe-stress response maintaining group (4.41%)—indicated the highest stress values among stress group clusters at the 3<sup>rd</sup> investigation. This implies that 13.55% of local government workers remained at a high level of stress 15 months after the earthquake. From these findings, it also indicates that 67.44% of the respondents who were in high stress felt that their stress was even elevating chronologically. In order to explain this phenomenon, implications from the second purpose of our study can be discussed now.

From our second objective, an investigation about how the initial condition of the public servants' disaster experiences and their attributes are related to the subsequent patterns of stress, the middle-stress response to high-stress response slow deteriorated group and the severe-stress response maintaining group are correlated with domicile damage and living outside their domiciles. In addition to the two clusters as mentioned above, the cluster that contains the highest proportion of people whose domiciles were completely destroyed is the high-stress response to low-stress response rapid improvement group. However, those two groups are different from the high-stress response to low-stress response rapid improvement group from the viewpoint that

people in the former groups have a high tendency of prolonged living outside their domiciles at the time of the first investigation. From this finding, one's experience of living outside one's domicile is considered as an important variable in order to determine the likelihood of one's continued improvement in the face of stress that is induced by the disaster. Also, members of the no-stress response maintaining group are least likely to have family member(s) who are dead or missing.

Meanwhile, no significance of stress response in correlation with disaster-related duties and overtime work was found. However, these items were asked only once at the 1<sup>st</sup> investigation. As for questions involving overtime, they asked participants whether they worked more or fewer than 100 hours of work, and the lack of identified significance is possibly due to some methodological errors. For the future direction of this continuing research, it is necessary to add more items that allow participants to describe recollections of their experiences in the survey form.

Lastly, the correlation between the current stress of the local government workers and the chronological patterns of stress, which is our 3<sup>rd</sup> investigation objective, will be discussed. In connection to K6 at the time of the 4<sup>th</sup> investigation, clusters including the severe-stress response maintaining group and the middle-stress response to high-stress response slow deteriorated group indicated the highest stress values, which are composed of 12.25% of survey participants.

With regard to K6 at the time of the 4<sup>th</sup>

investigation, score of severe-stress response maintaining group (C8) and middle-stress response to high-stress response slow deteriorated group (C4) are worst. And middle-stress response to low-stress response slow improvement group (C5), low-stress response maintaining group (C2), high-stress response to low-stress response rapid improvement group (C7), low-stress response to no-stress response slow improvement group (C3), low-stress response to no-stress response rapid improvement group (C6), and no-stress response maintaining group (C1) are follow them. Specifically C3, C6, and C1 indicate low score in any variables, thus they are clusters which have low stress response.

As for each factors of CSI, score of severe-stress response maintaining group (C8) and middle-stress response to high-stress response slow deteriorated group (C4) are worst. And middle-stress response to low-stress response slow improvement group (C5) and high-stress response to low-stress response rapid improvement group (C7) are relatively high score in specific stress response to a disaster. C5 and C7 had high stress response at the outset of disaster. The fact suggests that specific stress response to a disaster relate with state at the outset of disaster.

In terms of anxiety / tense, score of severe-stress response maintaining group (C8) and middle-stress response to high-stress response slow deteriorated group (C4) are worst. And middle-stress response to low-stress response slow improvement group (C5) and low-stress response maintaining group (C2) are

relatively high score in anxiety / tense. This order of score corresponds to patterns in K6 score at 3<sup>rd</sup> investigation and 4<sup>th</sup> investigation. Therefore, anxiety / tense have stronger relationship with recent conditions.

In terms of displeasure / anger, score of severe-stress response maintaining group (C8) and middle-stress response to high-stress response slow deteriorated group (C4) are worst. Low-stress response maintaining group (C2) is follow. As previously noted, C2 indicates relatively minor stress response at the outset of disaster. In view of this, displeasure / anger have relationship stronger relationship with recent conditions too.

In terms of autonomic symptom, severe-stress response maintaining group (C8) is worst. Middle-stress response to high-stress response slow deteriorated group (C4), middle-stress response to low-stress response slow improvement group (C5), high-stress response to low-stress response rapid improvement group (C7), and Low-stress response maintaining group (C2) are follow. C7 which had high stress response at 1<sup>st</sup> investigation have relatively high score of autonomic symptom score and specific stress response to a disaster. This common point means that autonomic symptom, along with specific stress response to a disaster, relate with state at the outset of disaster.

In terms of general-stress response (sum of “anxiety / tense”, “displeasure / anger”, and “autonomic symptom) and PTSD-like response (sum of four factors), severe-stress response maintaining group (C8) and middle-stress

response to high-stress response slow deteriorated group (C4) are worst, and low-stress response maintaining group (C2) and middle-stress response to low-stress response slow improvement group (C5) indicate relatively high score. The order of score is common in both clusters. This common point means that the score of general-stress response is able to drive up the score of PTSD-like response. Result in this study suggests that the upthrust might make expertise “PTSD develops late” too much.

### ***General overview***

First, one of the risk factor in disaster which is able to threat mental health relates circumstances in the aftermath of the disaster (e.g. damage of domicile / experience of life outside domicile). On the other hand, despite the overall mean score of K6 decreased with time, there is the cluster whose stress response increased about +1SD from 2<sup>nd</sup> investigation to 3<sup>rd</sup> investigation. In foregoing cluster, worsening of stress response might be caused by recent conditions. These results indicate that support persons need to look around both circumstances in the aftermath of the disaster and current conditions.

Second, instruments which are used for assess mental health of disaster victims such as IES-R (Weiss & Marmar, 1997) include items that measure a similar general stress response. To avoid confusion with general-stress response in assessment of PTSD-like response, scales for PTSD-like response would preferably be focused on factors that are related to one’s

experience and memory. If an individual demonstrates a high stress level in the middle of the disaster recovery process, detailed examination of his or her current conditions of stress would be clinically effective.

Local government workers are required to conduct restorative work starting early in the aftermath of the disaster and to continue these activities for a medium-term to long-term span. Problem of local government workers who have been impacted by a disaster which were recognized in Wakashima, Kozukua, & Noguchi (2014), such as heavy burdens of restorative work which increases with time, disparity of workload, uncertainty for the future, and rift with co-worker and family members, can become stressor. In other words, to care for local government workers, support persons have to consider not only direct impact of disaster but also problems caused by disaster indirectly.

#### **Acknowledgments**

This works was supported by JSPS KAKENHI Grant-in-Aid for Scientific Research (C) Number 25380915

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## **The Investigation on the Support for the Families Evacuated to their Relative's and the Accepted Families after the great disaster in Japan.**

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**ABSTRACT.** This study investigated the changes in situation and emotion of host families(wives) who received evacuee families after Great East Japan Earthquake(GEJE). Twelve subjects who accommodated evacuee families were interviewed. Eleven cases of accommodation were due to the accident of Fukushima Nuclear Power Plant and started just after GEJE. According to quality analysis with protocol data, host families tended to push themselves too hard through a month after GEJE, and start burning out from around three months after GEJE. Their burnout caused by their underlying stress as they couldn't tell it even to their family and friends. Troubles with evacuee families were observed in some cases from five months after GEJE. The main factors that host families handled their accommodation well were indicated as follows that evacuee family had, 1) Initiative 2) a low level of reliance on support of information and money. And in addition, host families just wanted to receive the words, “ thank you” from evacuees, and “ good job!” from their relatives.

**KEY WORDS:** The host families who received evacuee families, Mental health, Great East Japan Earthquake, Burnout.

### **Introduction**

National Foundation Brief Therapy (NFBT) has provided indefinite free counseling service, since April 2011, for evacuee families from the disrupted area due to the Great East Japan Earthquake (GEJE) to their relative's house, and the host families. Since NFBT has expertise in problem of family and system, and I have many experiences of interview researches and counseling activities (Ikuta 2009) .

Many of evacuees of unprecedented GEJE refuged to shelters, or their relative's/ friend's house. Evacuees in shelters mostly received

supports from whole Japan; in fact, shelters were under the spotlight enough to be reported a fatigue of helpers there by some media. But the evacuees in their relative's/ friend's house. Evacuees in shelters mostly received supports from whole Japan; in fact, shelters were under the spotlight enough to be reported a fatigue of helpers there by some media. But the evacuees in their relative's/ friend's house took little support and were neglected in obscurity.

Evacuee family was assumed a lot of similarities to common multigenerational family in the point of composite-type of multigenerational cohabitation and the result of my research was inferred the possibility of application in support.

We affiliated with Japan Civil Network (JCN) and mainly implemented PR activities through JCN. The free counseling was provided

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for evacuees to their relative's house and the host relatives, though, we also accepted "host families for child evacuees" since they hoped to take telephone counseling with a difficulty of visiting to counseling facilities, and in addition, consulted about style of their families: our specialty area. Our service was not assumed a niche industry but "a niche support" as some consultants mentioned, "you are the only service to help evacuees to their relative's house."

### **Methods**

Subjects for research: Evacuee Families who experienced current or past evacuation to individual house, and host families who received evacuee families.

All candidates were evacuee families excepting who evacuated their children, and host family members who were evacuee's relatives (mostly wives) excepting who received children evacuee.

Candidates were interviewed with a central focus on the following points: 1) family structure, 2) process to cohabitation, 3) residence form, 4) episodes about problems which were forced to handle, 5) social resources, 6) chronological changes, 7) atmosphere of their family after starting cohabitation, 8) subjective evaluations of cohabitation, 9) advices for pre-cohabitation families, 10) whether they request to be sent a brochure about books for reference and a neighbor guide

Twelve cases, including researches, were offered. Eight cases of them were continued

multiple times. And one case is ongoing. Eleven cases were evacuees to other prefectures (Tohoku 1, Kanto 4, Kansai 3), due to the accident of Fukushima Nuclear Power Plant. One case was evacuee to other place in Miyagi due to the disaster of tsunami in Miyagi.

### **Results**

Few counseling cases were offered until the end of April. The matters in May were all positive; "I wonder if I cure evacuee relatives much better." According to quality analysis with protocol data, evacuee families had sadness of the disaster and a sense of gratitude for accommodation, and host families had sympathy for them and a strong motivation that they helped evacuee family in anything they could. That was assumed "honeymoon stage" just after evacuation (from 2 weeks to 4 weeks).

However, the number of counseling cases rose steeply from around June, also, the matters was turning negative; "the evacuee family doesn't have any common sense," "I'm so exhausted that it is uncertain about the future," "I'm under the overload," etc. Most of them felt, "I have to conceal what I stress from not only the evacuee family but also my own family and relatives." Cohabitation due to the disaster necessarily causes many kinds of matters because it was suddenly happened without any mental preparedness, uncertain about the deadline, and let them fatigued due to concerning for evacuees. However, it was inferred that they strongly repressed negative feelings; "I must not have negative feelings

because I'm happier than evacuee family." And the repression produced a strong mental fatigue. Many matters of cohabitation due to disaster were perceived to come out three or four months after the disaster rather than just after it.

After August, serious matters increased; "I have a trouble with my relatives," "the evacuees brought up the idea of moving a shelter. I'm shocked if there is a fault on my part, despite I'm doing my best," "I was willing to let them move to a shelter because they preferred a lot of information and support in it. But I'm shocked that a relative said to me if I kicked them out."

In the medium-to-long-term, disaster victims start comparing between their current living environment and other shelters' one, and political support systems. They gather information, and in addition, become frustrated with the difference; "it's unfair that there is such a big difference between me and him despite both have the same background." Although this was a social comparison process due to a stress condition, host families guessed evacuees' thinking as "the grass is always greener on the other side of the fence," and that view became a strong stressor. Psycho-education was effective for these cases.

The cases which were relatively working and the others which were not working (dividing them depending on with or without continuance) were compared, and then the factors of difference were categorized the following items;

1) whether evacuee family and their host family gather information and take an action to

make a decision, on their own initiative, about their future.

2) burnout of host family

3) degree of dependence on host family

4) negative spiral of social comparison process

5) difference in lifestyle

The series of 1) to 4) was described a structure of negative spiral between what evacuee depended on their host and what host increases burden. And in addition, consulters who received their own relatives had a stronger loneliness feeling as they were unable to ask for help to those around than who received their husband's relatives. This point was common as general multigenerational family.

### *Discussion*

The items as follows were considered as effective supports;

1) repeating appreciation for their making an effort and playing a role in support after the disaster by receiving an evacuee family; this was a kind of compliment technique in brief therapy.

2) psychoeducational approach as an expert opinion; victims are in particular psychological state in a stressful situation and have a difficulty in understanding things from "the other person's perspective," etc.

3) interviewing consulters about the all family members' efforts of receiving victims for several months, and supporting what each and all did an excellent coping.

And in addition, parent training was effective for host families for children evacuee.

Host family doesn't want to a big gratuity but just wants to be said, "you've been very helpful," "thank you," and by other relatives, "good job," then, they can recall the long period of support as "a good memory of striving." However, if they have a trouble with evacuees in the end, they linger over a harrowing feeling without even sharing memories and feeling in that period with their family.

I made the biggest impression that many consulters got their eyes watery when I told, "I will express my deepest gratitude that you propped up the reconstruction from this unprecedented disaster by receiving evacuee as one of Japanese." I remember that the word didn't come from as a counseling technique but my real thought. Also, I was often questioned, "are there any similar consult with mine?" If I just told, "yes, there are," many consulters sounded relieved and said, "It's not only me, is it?" There were three telephone call; "I don't have any special problem, though, I can put in effort if only I know there is an institution which turns it's eyes to host families." That means we count for focusing on "family" as experts of family therapy/ brief therapy.

In the end, I would like to sincerely show my respects for the members of PTG team of Tohoku University who are supplying support service in the disrupted area, Professor Yoshida who is outreaching in Soma, Fukushima, the members of MCR who came to support Sendai, and the all who engaged in support activity by

each profession.

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## What Gregory Bateson's thought brought about Japanese brief therapy

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**ABSTRACT.** This article is the summary of the 31st Family Psychological Association independent symposium. We examined the future direction of Japanese-style brief therapy, which does not adhere to a change too much, based on Bateson's ideology.

The contents of each topic provider are as follows. Kousuke Ishii presented the approach of the de-addiction to focus on the part which has already been changed. Masafumi Nakamura showed possibility of 'do different' based on Bateson's multiplex description. Hiroki Nagaishi showed the significance of not changing in strong restriction of the palliative care unit. Hiroaki Matsumoto showed the directionality of the resource to entrust a pattern based on Bateson's redundancy. Finally Kohei Sato who was a designated debater showed significance and a problem of the de-control-like approach as the common point of each topic provider.

**KEY WORDS:** *Bateson, Brief therapy, Family therapy, Psychotherapy, Japanese*

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### **Intoroduction** *Hiroaki Matsumoto*

As is usual with psychotherapy, brief therapy has a textbook-like history. It is the communication theory as a theoretical base and is Gregory Bateson's double-bind theory that was the opportunity. However, what visible is not all with the history. Bateson headed for Hawaii leaving from MRI that he had been conducting a collaborative research about communication of division disease with in 1963, but the relation with MRI have already been damaged at this time. According to Dell (1989),

this situation is not only what's called personal quarrel. It was regarded to be a confrontation exemplifying a clinical viewpoint and an arguing point of the brief therapy about how to grasp things and relations.

The focus point of a group therapy is how to grasp changes, however, it can be a clue to find out the view of Japanese-style brief therapy that does not adhere to a change too much, to turn our eyes on thought and philosophy for Bateson who dared to leave from the binding of communication theory of MRI. This paper is a summary of the arguments by four topic providers and Sato, who was the designated debater, at the 31st Family Psychological Association independent symposium that was planned from the interest in the problem above.

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***“Think about Family therapy to entrust to a change”***

***Kousuke Ishii***

In addiction clinical site, there is not little on-site staff who have an awareness that it is hard to associate with alcoholics. No matter how hard they take care of alcoholic patients, the patients cannot do without drinking alcohol. They are betrayed. They are lied to. Repeating such an experience, a feeling of ineffectualness and thought not to be able to care well increase to them, and even a help expert is apt to have an awareness that an alcoholic is hard to care. In such a situation, we tend to think we shall try to control our patients or clients. Although people suffering from alcohol dependence are the people who are trying to control their drinking action but failed it, the staffs are also getting addicted trying to control such people. Thus, an addiction clinical scene is regarded to be a place where a vicious circle is easily caused, that is staffs are engaged in care addictively for the people suffering from addiction. Falling into such a vicious circle myself, I will here suggest that "it is impossible to perform the approach to addiction addictively", "de-addictive approach is necessary instead".

Firstly, I will take up Gregory Bateson's view of change. He is well-known for Double bind theory in 1956, but he left MRI in 1963, then wrote an article 'The Cybernetics of "Self"' in 1971 (Bateson, 1971) and summarized the way of thinking and view of change of the group that became a model of

Alcoholics Anonymous and Self-Help group to be mentioned later. Bateson died in 1980, but about 30 years later, his daughter Mary Catherine Bateson visited Japan for the 26th meeting of Japan Association of Family Psychology of 2009. It was impressive that she introduced that Bateson had been always telling her "do not try to change the situation, try to see the situation" in his later years (Bateson, M.C., 2009).

AA proposes direction for addiction that is different from the direction to help addictively. In 1935, two alcoholism people called Bill and Bob met, then they established AA. The famous 12 steps begin with the first step, which is "we are powerless against alcohol, and we admitted that we were not able to live just as we wanted to. (AA Japan Press, 1979)" Bateson focused on this unique approach too. In addition, Manabu Saito who were promoting eagerly in our country reports as follows: the alcohol addicts like Bill and Bob appeared from the strongest part of America, that is, a white person, in a middle class and a Christians, and dropped out of it. A way of thinking to regard power belief as insanity started to arise among these people (Saito, 1995). In other words, it is thought that the view that rooted in the society which we must control things by our own power ironically brings up an illusion that we can control even what we actually cannot, and individuals fall into addiction. Our current society in which effectiveness is demanded, and the society in which we have to get over various things by ourselves leads us to the way of thinking "addictive society" that an

American therapist Schaefer named (1987). AA is the view that is not addictive, so to speak, de-addictive as an antithesis in such a society in which “we have to control ourselves by ourselves”, but in fact, there are a lot of examples about such a view in our country.

For example, in Kamakura period, Dogen who is the founder of Soto school of Zen Buddhism insisted to stop the practice striking with a ‘keisaku’ (encouragement stick), which was common in Zen practice in those days, and remonstrated about forcing a change. In addition, Encho Sannyutei, who was a comic story teller called the great master, was given the name ‘No-tongue’ as his *koji* (posthumous Buddhist name) by Tesshu Yamaoka who advocated the idea of ‘Ken-Zen Ichinyo’ (swordsmanship and Zen are one and the same). In that idea, it is ideal that the greater master a comic story teller becomes, the less he speaks with his tongue. Originally there is an aspect to give a title of master for the point that even a story teller does not stick to talking well or producing a change in our country. Furthermore, Danshi Tatekawa, who also was a comic story teller and died in 2011, showed the view of Rakugo affirmation of the work (Tatekawa, 1985). That is, it is unnatural to divide what is mixed into this is good or this is bad because it is not important to define what is good is good while what is bad is bad but what is bad is also in human.

In the idea of Alcoholics Anonymous, we do not try to do something by ourselves or change something, but we entrust to a change. In addition, the point of view that “I will cause a

change” or “I will operate” is rather undesirable when a change is considered in the culture of our country. Therefore we come back to the first point “is it impossible to help the addicts addictively?”

It is often said that we cannot change other people. However, to be a little more precise, does not it mean “we cannot change other people addictively”? We cannot force other people to change toward a certain direction, but we can change them de-addictively. In this sense, we still insist that “we can change the others” in Family therapy. For example, humor is important in Family therapy. The humor is not a direction but rather a deconstruction that excludes the context. In addition, the surprise homework, which is to try something surprising when you are in the vicious circle and no change happens, is also a de-addiction because it is not to be directed to a certain direction but to try something completely different from the present situation. Especially, Double Description Model (DDM) (Wakashima and Hasegawa, 2000) already includes the essence of de-addictive approach and is focused on again now. DDM is the approach that assumed preventing a vicious circle of MRI and expansion of a virtuous cycle of SDBT to be two main factors connected each other, and the stance of it, that is “small, easy to accept and interesting” without asking any unnecessary control for clients and customizing intervention thoroughly, is de-addiction itself.

Finally I will introduce prayer of the peace that AA members make much account of, which is “God, please give me calmness to

accept what we cannot change, courage to change what we can change and wisdom to distinguish these two". The sharp look to the control illusion that is going to control what we cannot control is put in here. However, another sentence is probably added here in the de-addiction approach of Family therapy. That is "sensitivity not to overlook what I have been changing". In other words the characteristic of the de-addiction approach is a viewpoint to assume that we try not to fall into dualism of changeable or unchangeable by paying attention to the part that has already been changed.

***"What provided from restriction and description -From Bateson's epistemology-"***

***Masafumi Nakamura***

The family therapy has developed and progressed based on epistemology including communication theory and system theory of Bateson, G. After having learned biology in Cambridge University, Bateson changed his major to cultural anthropology and engaged in fieldwork in New Guinea, Bali and so on, then he made the range of epistemology widened to cybernetics, system theory and communication theory. From 1952, he performed a study on communication of division disease with Weakland, J and Haley, J from 1952, then Jackson, D joined them and he proposed Double Bind hypothesis afterwards in 1956. It can be said that Bateson's epistemology became a chance for the paradigm shift from the viewpoint that a mental disease is caused by an individual that conventional psychiatry

postulated. It may be said that Bateson showed a dualism thought, the direct causality theory and a concern for controlling in the past books and papers, and had a big influence in various fields, and he is the person who searched a pattern to connect an object with throughout all his life.

What Bateson concerned about and pointed out can be seen in a clinical situation. It is easy to fall into the thought of dualism or direct causality theory even if we are cautious about it in the clinical scene, and we may receive various restriction unconsciously. Studying Family therapy sometimes brings the binary opposition, "individual (inside of the individual) or system (relation between individuals), and we may be restricted by the problem of the past or internal world especially when a mental symptom and causes of a problem are talked as a past trauma. In this article we would like to think about the new aspect of Family therapy that does not assume the restriction a problem but makes use of the restriction based on Bateson's epistemology.



(Bateson, 1967)

The picture on the right is what is shown on Bionics of spirit (Bateson, 1967), which was drawn by a painter in Batuan village, Bali Ida Bagus Jati Sura, in 1937. What he wanted to convey by this picture is to avoid fixing of the theme. In the structure of the painting work, Bateson said as follows; this will give an impression of "noisy and restless" to the eyes of the Westerner. To the eyes of psychoanalysts, it looks to be the expression of "uneasiness" and "obsessions", a game of the sexual interpretation proceeds really easily if we are to do so, and he expressed concern for being fixed. I think that even in a clinical scene, we will be able to describe precisely and widely by looking the theme with no fixing idea, and it will lead to see our clients and their story versatility. For example, when a client who has a trauma talks about his/her trauma experience, the viewpoint is usually fixed on the event. It makes our interpretation restricted and makes other parts hard to see, and the story sometimes proceeds by the restricted interpretation. It is thought not by interpreting but by describing, it will be possible to construct a new context and a story such as asking the relation between the trauma and the client.

Next I will explain about restriction and description a bit more on the basis of my experience. When we consider about support for developmental disability including mental retardation, we may be strongly restricted by the diagnosis name or the result (numerical value) of the psychology test and so on. I have seen some cases that the result of a psychology test did not overlap with the condition image

until now. Of course, originally a support should be performed based on the result of the psychology test after understanding the condition image, but describing the conversation with the clients and their action makes "to describe = to affirm" and helps to construct the better relationship, which leads to a smooth support in some cases. Because describing will be neglected and the support may dissociate from the condition of the client and when we are restricted by the diagnosis name or the result of the psychology test, I think describing is important. It is thought that describing is useful in the action observation for the client who had a developmental disability including mental retardation not only in a counseling scene.

In the clinical scene, there are some elements hindering a description. At first it is a diagnosis name. When the clients have been diagnosed personality disorder, depression, the developmental disability, we tend to look and grasp based on the diagnosis name. And we tend to treat them for example in a way of listening based on the diagnoses name, which hinders describing. In addition, the experience of the therapists can be what hinders describing. The more experiences they have, the more they listen to the clients' complaints and their symptoms, comprehend and guess what they think too much and adhere to the way of approaching to the symptoms too much. Although a diagnosis name, specialty an experience can be a guidance, treatment and the clue for it when supporting a client, I think it is important to be conscious of that being

restricted by strong context can make description negligent.

As significance of describing, I think describing definitely will be “Do different” because there is a possibility that describing simply becomes negligent when restriction of the context is strong. In other words it is not an alternative of whether being restricted is a problem or not, but the importance of describing while being restricted.

A problem to be restricted and is the importance of describing it while it is restricted. Bateson said about the stricture of the painting work mentioned above that “it should be seen as the work with double-theme”. It is though that looking at things with the idea of double-theme, furthermore with a wide viewpoint including restriction and description makes alternative wider and richer. In other words, I think not only promoting a change such as suggestion and intervention, but also controlling a change under strong restriction can be “Do different”. I think being conscious of restriction and a description, and stronger restriction make description useful, and new bonus may be provided by watching things without a fixed idea just like ‘both eyes vision’ that Bateson said.

***“Life and death and Family therapy -from a look of Bateson-“***

***Hiroki Nagaishi***

Working as a psychologist at a palliative care unit now, I feel that the words such as ‘palliative care’ and ‘life and death’ have a strong binding force. In a framework of

palliative care, the relationship with a supported person and the supporter is divided into people who are being supported and people who are supporting, or living people and dying people. There is a paradox that s supported person lives for the moment under the context of accepting death while the supporter promotes the acceptance of death for the supported person feeling that death is far off. On the other hand, fortunately, we perform Family therapy which is based on a great epistemologist, Gregory Bateson. In other words world, I think how to catch Bateson’s mental world may include a hint of some kind of support about the life and death from the viewpoint of Family therapy

According to WHO, palliative care is defined as "approach to improve QOL by discovering a pain and other physical problems, a psychosocial problem and a spiritual problem for the patients and their family facing the problem due to a life threatening disease early, preventing and softening the pains by performing appropriate assessment and treatment". A presupposition of control already can be read in this definition. In addition, as for the life and death (spiritual), it is included in the context called control as well.

Here, I will introduce example 1. A big change was added to the example because of the duty of confidentiality. Seventies, a male, stomach cancer. The patient (afterwards: IP) had an interview many times from the beginning of intervention until just before his death in the context of acceptance of death asking “how is the psychological condition of

the person dying?" and "how should I face with death?". IP was always conscious of life and death in the interview, and had a long hard time thinking about fear or uneasiness for death. The therapist (afterwards: Th) was also kept bound by IP's question about death he was asked repeatedly; how can he accept death?, how can he be a bit more eased mentally?

Then how did Bateson consider death? In *Bionics of spirit* (Bateson, 1972), he defined the spirit not as what existing inside a body, but including the connection outside the body. If we think that there is a borderline between inside and outside of our skin and spirit is inside, it means our spirit will be lost with our body. However, if we assume that spirit is not only inside the body but it is made mixed with the rout outside the body, a different recognition of death will occur. Not that both body and spirit are lost by death, can we think that the pattern which has been composed our spirit until now is transformed into another pattern by death? The following is also the words of Bateson; "The contents covered by skin spread at random in death, and the routs inside the skin spread at random as well. However the idea will be converted again into books and artworks to continue and keep going round the world. Socrates as the individual discussing energetics of the life have died far back in the past, but it is reliable that his big part is still living in the current ecology of idea as one of its components." (Bateson, 1970. *Form, Subsistence and Difference*). Therefore, the idea of myself and the feeling (for life and death) are also the spirit made from the

connection with the world outside of the skin including the relationship with the staff helping to reduce the pain, and if we think so, it will be the natural form of our spirit to entrust to spirit (in other words a system and a pattern).

I will show you another example of entrusting to a system and pattern. A male in his sixties, lung cancer. The contents of the interview were mainly about cars which is his hobby from the first, not to mention uneasiness for the disease and life and death. About the disease, life and death, a talk about his hobby or weather, a talk about the sea and scenery watching the see. Various connections were performed including not only words but also what need not to be mentioned. As for this case, unlike example 1, IP spent a lot of scenes and Th also was not restricted by one context.

When we go back to Bateson's thought above again, it is considered that each idea appearing from various communication and its interaction is the subsystem which constitute IP's spirit. And it is thought to be important for Th to listen carefully to IP, the spirit appeared in the interaction and subsystem. This is because description is constitution and can a part of spirit what Bateson said. This part of spirit is also a part of IP's spirit converted in Th, which is thought to be a part of spirit constituting IP's spirit as well. Furthermore, A part of Th's spirit converted in IP also constitute a part of Th's spirit. Therefore, it is thought that trying to convert this pattern here now by some kind of method more than that will cause some kind of tangle in the rule of conversion generation, in other words, it makes

it likely to be put in the double-bind situation. Entrusting to a natural pattern like this, it will be possible that another context other than the restricted context such as palliative care and life and death is constituted. Any kinds of talks are all important. And there is a possibility for Th to be able to get eased by entrusting to conversation. Situation and state are keeping changing. However, the distance between what is changing and what never changes is extending by entrusting to conversation and control a change as much as possible. Then the meaning of what never changes will increase over time.

It is thought that there are two “Do different” in the restriction such as “palliative care” and “life and death”. The first one is “Do different” called curiosity. I think we can keep entrusting to what never changes because there is curiosity. This means that when Th and IP constitute each other’s spirit, curiosity occurs in the conversation generation itself which constitute the spirit. The relation between Th and IP is still somewhat conscious of controlling each other and “change”. Then just it is not curiosity anymore. The curiosity here is the pure curiosity for an unknown thing appearing from the result of each other’s natural interaction, and it is very difficult to have curiosity each other, and it is thought to be “Do different” in a clinical scene. As for the second one, what never changes is thought to be “Do different” itself. Even if the situation changes, the conversation does not always change together. When the situation changes, normally the conversation changes accordingly, and there is an effect of changing

it. The words by Bateson “do not try to change the situation, try to see the situation” may be a message questioning the recognition for the change again.

***“Resource found by ‘entrust to a pattern’”***

***Hiroaki Matsumoto***

As the recent trend of Brief Therapy, there are the shift from a compliment to a summary seen in BRIEF which is developing a solution-oriented approach in the United Kingdom (Shennan & Flanklin, 2012), focusing of “Do more” (Wakashima, 2011), and the approach of narrative and solution on which Yoshikawa insists (2014). As the background of these, there are introspection, a feeling of difficulty and discomfort for over-emphasizing of the solution. As a directional clue of SFA in future Japan in this situation, I reexamined “Resource” concept based on Bateson as a start. Resource is a concept of SFA which makes power of the client oneself be focused on from a viewpoint of resources and their nature. It is generally used in a clinical scene like “this is a resource for the client”. However, there is not a little doubt to seeing resource fixed. In addition, because the resource concept was focused on after the presentation of the exception in SFA, there is the impression that the relation between both of them is slightly vague. The resource is divided into the external resource which is usable in the surrounding environment like schools and parents and the internal resource such as integrity of the person oneself, a positive viewpoint or so. But it is said that the external and or internal reality can be mixed

easily (Kawai, 1994). In the first place, is it appropriate to apply this classification in Japan?

According to Kawai who sorted out the type of Japanese and Western stories, the pattern of the Western stories have introduction, development, turn and conclusion, and the separation of a narrator and the listener is clear. For example, that is a story of a hero who goes for adventure, defeats a monster, gets a higher social position and then marries a princess and lives happily. On the other hand, as for Japanese narratives and folktales, they had basically been passed down orally, their authors are unknown, the contents are easy to change slightly and they have no punch line or lesson, which sometimes make people feel deluded. For example, there is a pattern of "ban of 'No seeing'", which is, a woman suddenly forces herself upon a man and they get married, but the man breaks the ban seeing what he is not allowed to, then the woman leaves him and everything goes back to nothing at last. In the West where "integrity" is made much of, a fault and an evil are excluded and cut off separately. In Japan, on the other hand, "totality" that is achieved by rather accepting an evil is considered to be important with maternal society theory as the background. In this way, the way of thinking to root in a Japanese story which does not stick to clarity as a story, not always distinguish in and out or good and evil can be a clue of the outlook on resource which is useful in a clinical scene in Japan.

One of the clues to think about a resource from Japanese-style context is short poems

system literature such as Tanka, Haiku and Senryu. As an example, I will introduce "Shinsai senryu" (meeting publishing Minamisanriku "Shinsai senryu", 2013) that was shown at a meeting for rationing of goods at Asahigaoka-district in Minamisanriku-cho and healed the The Great East Japan Earthquake victims. As a senryu has the restriction of 17 characters, the subject is easy to be omitted. By this restriction the subject is always omitted structurally if it is "I". Therefore a Senryu with "I" as the subject is structurally. In addition, though it is assumed that a Senryu has a humor in it, but the sense of humor is not always needed. For example, like a following Senryu which arose people's sympathies the most after the earthquake, there was a feeling that could be expressed straightly especially in a Senryu; "Massive tsunami, Swept everything away, What a fool"

In the case of the West, the power of the individual image is relatively more important. However, especially in Japan it may be necessary to reconsider the presumption of the internal image in individuals itself when based on the story view mentioned above. That is, an individual does not always have to come up with an image. In Shinsai Senryu, which has 285 poems in all, the similarity of the chosen term such as a big tsunami, revival and the name of each area is significant. In addition, there were some replying poems forming a pair like follows; "I'm in trouble, Need a wife, As relief supplies" and "This in what, Impossible, A wife supply". In this way, the repetition in the wide meaning beyond the poem including

the repetition of the same words and theme is meaningful in Senryu.

In other words, in Senryu, the framework of pattern to support originality of the phrase functions as a resource in a wide meaning. Not affirmation as the topic but describing itself, e.g., ourselves or the relation with us is not always necessary to be mentioned, we do not have to tell something original and we do not have to describe everything in detail. This is the power that Senryu as a pattern prepares. This is not to ignore the meaning of each Senryu at all. It is the direction to think a great deal of both the power of the pattern and the power of each Senryu.

This point of view to value the pattern is tied to Bateson based on the concept of redundancy as clue. "Redundancy" generally means to be unnecessary or roundabout when it is used in Japanese. For example, redundancy in information theory has a failsafe function to distinguish a human error like the combination of number and alphabet in with a membership number or an examinee's number. But it does not produce any new meaning. On the other hand, Bateson's redundancy is considered that "It is able to predict a remaining state from one part with probability more than random" (Bateson, 1968). Bateson regards this redundancy to be synonymous with "meaning". There is Bateson's unique viewpoint for redundancy as a background.

Bateson set an observer of the third party who is to find a pattern of redundancy and showed a redundancy model to find a meaning in the pattern of repetition itself that the

observer finds. For example, as for a mother who tells her child "be careful" repeatedly, we can guess that she is worry about her child, and she will say "be carefull" again if we are in an observer's position. The meaning of this predictability found by the observer is redundancy. There is the reason why Bateson made much of the redundancy in that the meaning was found as predictability by observing a pattern.

Bateson's redundancy focusing on the role of the observer suggests the importance of the viewpoint to find a pattern as repetition. For example, a therapist is an existence who can be a clue to find a pattern. In addition, a clinical scene is originally full of redundancy; the treatment structure in an interview, a parallel interview to share the state of a mother and her child repeatedly, and a pattern of a family history found by genogram and a comparison of the result of the psychology tests taken several times. The attitude to be able to entrust to the mild connection and similarity between patterns, in other word, Bateson's entrust to redundancy to stand in a position of an observer has a possibility to fit a clinical scene in Japan as an outlook on resource not to adhere to the presence of resource and distinction of outside/inside. Shinsai Senryu is one of the examples.

There are very strong contexts such as addiction, trauma or palliative care especially as a target in a clinical scene. In such a situation, it can be strong "do different" to entrust to a mild pattern which has been existing even if there is contradiction. In other words, Bateson's

redundancy tells us that a pattern is the resource, and moreover entrusting to a pattern can also be a resource.

*Designated discussion Kouhei Sato*

As the common point of each topic provider, there were the keywords such as “as it is”, “to entrust”, “de-addictive” and “mild pattern” rather than the idea to control based on the thought of Gregory Bateson.

By the way, the time Bateson lived is regarded to be the turning point where it was shifting from the time when controlling was looked on too optimistically to the time when it was not so.

In the 20th century, the doubt to the classical-physical and Laplace determinism that was mainstream in the 19th outpoured in various fields of study.

In ecology, for example other than physics, the view that to control is not so easy as seen in a food chain; the method to reduce the number of rabbits cause reduce of the number of the animals that eat rabbits, which lead to increase of rabbits after all. There were Bateson or other system theories in the time those studies were blooming. It was confirmed by the argument of each topic provider that Bateson was the researcher, the scholar of the time. On reflection, though it might be because I placed importance on the education field myself, but it seems that the value of “as it is” and “to entrust” in the scene of clinical psychology has declined now compared to the time I was a graduate student. In education sites, PDCA cycle, which originally was the method to

conduct production management or quality management smoothly, was introduced, and besides, the cooperation with the specialized agencies including medical institutions and the police has proceeded in the Law for Measures to Prevent Bullying or so. In other words, a way of thinking that the problems are in individuals and we will control the problems by sometimes cooperating with other organizations is becoming very strong. In addition, as my personal impression, it seems that we have less chance to hear about the way of thinking such as client-centered therapy, also in the field of clinical psychology. Instead, cognitive-behavioral therapy has come out, which has the evidence such as performing worksheet based on a learning theory and a cognitive idea but has made the idea of control much stronger.

One of the causes is that clinical psychology itself has been becoming common and various people in society see it now. When clinical psychology is incorporated in society, more accountability is demanded. For example, ordinary people and members of an assembly are not familiar with System Theory and Bateson. Then the explanation for them is apt to become mechanistic or direct causality. The idea of control is included in the definition of palliative care defined by WHO. In this way, I think that it is the change in the last 20 years that control or management has been becoming strong as the foundation.

We are often asked to control or explain about controlling as a clinical psychologist in society. In this, it is relatively easy to achieve to

let it be as it is and to entrust, or to take such an approach probably in the field of AA and palliative care. Moreover, it is easy to say in case of social withdrawal. It is because this is a topic that most people reach an agreement that it will take a long time to be solved. On the other hand, for example, in the case of school refusal, can we really strongly insist on being as it is at school?

In other words, it will be the key in the future clinical scene to consider that if it is possible to take “as it is” approach or de-addictive approach for the problem such as school refusal, bullying, depression and so on which seems to be controllable, and if possible, how we can contrive it.

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