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Examination of the effect of a marital symmetrical communication pattern and the amount of communication on problem-solving: Attempt to apply Integrated Information Theory to the family system

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ABSTRACT. The purpose of this study is to elucidate the qualities of family systems that are more capable of solving problems. In this study, we applied the schema of Integrated Information Theory (IIT), which explains the phenomenon of consciousness, to family research and tested the following hypothesis: higher symmetry leads to greater problem-solving ability in more communicative couples. We understood the couple's difference from the symmetry of their communication, and the couple's interaction from how much they communicate. We also distinguished between ordinary and problem contexts when investigating the difference and interaction in couples. The questionnaire survey was conducted to 312 married respondents (156 males, 156 females; average age 45.18 years). We took the couple's problem-solving ability as a dependent variable, and communication score, symmetry score, and an interaction term for both scores as independent variables, and performed hierarchical regression analysis for both ordinary and problem contexts respectively. As a result of this analysis, it was shown that, in ordinary contexts: (1) greater symmetry means greater solution-oriented attitude in more communicative couples; and (2) relationship-maintaining attitude is greater in more communicative and complementary couples. It was also shown that, in problem contexts: (1) solution-oriented attitude is greater in more communicative couples; and (2) complementary means greater relationship-maintaining attitude in more communicative couples. In the future, it will be necessary to test the hypothesis having controlled for the nature of the problem.

KEY WORDS: Integrated information theory, Family system, communication, problem-solving

Introduction

Integrated Information Theory (IIT) is a theory in neuroscience that explains the multidimensional phenomenon of

multidimensional phenomenon of consciousness. IIT was presented by Tononi (2004) as neuroscientists have sought to explain the phenomenon of consciousness in recent years. There are around 100 billion neurons in the entire brain, around 80 billion of which are found in the cerebellum. The thalamocortical system, which is made up by the cerebral cortex and the thalamus, contains around 20

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billion neurons. If the cerebellum is removed due to some disease, language and movement become difficult. No problems arise, however, with consciousness. This means that the multidimensional phenomenon of consciousness cannot be explained according to the number of neurons. Integrated Information Theory is one theory for solving this sort of problem. This theory posits that the phenomenon of consciousness arises from the *difference* (diversity) and *interaction* (integration) amongst neurons. *Difference* and *interaction* create consciousness. *Difference* and *interaction* mean greater amounts of information.

Attempts are underway to apply IIT as a system theory to spousal and familial systems. When applying IIT to family research, three points need to be discussed: (1) what constitutes the *difference* in a family; (2) what constitutes *interaction* in a family; and (3) what is the product created by *difference* and *interaction* in a family. However, no clear answers to these questions have been obtained. Here, Wakashima et al. (2018) investigated the hypothesis that "the couple who has the higher score in both *difference* and *interaction* has higher problem-solving abilities and resilience than other couples". This study measures *difference* in couples through three facets: "ways of thinking", "preferences", and "abilities". *Interaction* in couples is perceived from amounts of communication that are measured in two ways: from verbal communication such as a couple's conversations, and non-verbal communication

such as eating dinner together and sharing their time. The study posits two products of *difference* and *interaction* in couples and families: the couple's problem-solving ability and family resilience. "Family structures" (e.g., "bonds within the family", "power relations", "openness"), and "family functions" (e.g., "family's problem-solving abilities", "family resilience"), have often been used as variables in research into families. The phenomenon we experience as consciousness is considered not as a single amalgamation constructed from *difference* and *integration*, but rather as a function they create as a whole. Accordingly, Wakashima et al. (2018) used variables related to the couple's "family functions", such as problem-solving ability and family resilience, as outcomes. Wakashima et al. (2018) examined the influence exerted on a couple's problem-solving ability and family resilience by the difference and amount of communication within the couple. The results indicated that the following two points were positively related to problem-solving ability and family resilience: (1) less difference in "ways of thinking" and "preferences"; and (2) higher amounts of communication within the couple. In other words, the hypothesis was not supported. This may be due to the following reasons.

(1) First, there is the possibility that the three facets used to measure *the difference* in couples, i.e., "ways of thinking", "preferences", and "abilities", ended up measuring how bad a couple's relationship is. Namely, there may have been a negative bias. Therefore, it is

necessary to measure the *difference* in couples in a manner that avoids the occurrence of negative bias as much as possible. One way of doing this is, as in the present study, to examine differences that arise within couples by measuring symmetry and complementarity. To start, “difference” in integrated information theory refers to the difference that can produce the amount of information. Symmetry is defined as being based on homogeneity, whilst complementarity is based on heterogeneity (Watzlawick et al., 1967). Considered from the perspective of information amounts, meanwhile: if complementarity is where A makes a suggestion, and B accepts that suggestion, and the amount of information held by A is 1, then the amount held by AB will also be 1. On the other hand, if symmetry is where A makes a suggestion, B also makes a suggestion, the information amount held by A is one, and the information amount held by B is also 1, then the amount held by AB will be 2. Here, the value of 2 is the minimum; there is also the possibility that the two suggestions may also lead to a third perspective. Thus, in this study, we operationally defined symmetry as high information content and complementarity as low information content.

(2) Second, amounts of information may differ between ordinary circumstances and extraordinary circumstances. In ordinary circumstances, there may not be a need for so much information. Ordinary circumstances are situations in which there are no problems or problems are well managed when they occur. In such situations, it is thought that problem

solving is achieved by selecting and executing the solutions usually used by convergent thinking. On the other hand, extraordinary circumstances are considered to be situations in which a novel problem arises or emerges because of inadequate handling of the problem. In such situations, it is thought that the problem can be solved by creating a new solution through diffusional thinking and then selecting and executing an action through convergent thinking. Thus, the amount of information required is different between ordinary and extraordinary circumstances because the thinking process in problem-solving is different between them. Accordingly, a variable for ordinary/extraordinary circumstances needs to be introduced.

Adding to the reasons and solutions above, we have also chosen to measure family functions by taking problem-solving ability, a function easily interpretable within a narrow range, as our dependent variable. Previously, problem-solving ability and resilience have been used as dependent variables, but since resilience indicates a potential ability of the family, it may not be appropriate to handle it as a result. In other words, it is difficult to interpret. The purpose of this study is therefore limited to an examination of problem-solving ability, and we conducted our investigation having posited the following hypothesis:

Higher symmetry leads to greater problem-solving ability in more communicative couples.

Methods

Procedure

We used a survey company to conduct an online questionnaire survey of 312 married couples of Japan (156 males, 156 females; average age 45.18 years, ± 11.708). We included details explaining the survey (regarding the aims of the survey, handling of personal information, feedback on the results, and consent) at the start of the questionnaire, and obtained responses only from participants who gave their consent.

Scales

The questionnaire was composed of three parts. Part A asked respondents to recall and respond to questions about “ordinary circumstances”. Part B asked respondents to recall and respond to questions about “circumstances in which the couple or family is facing an issue or problem”. Part C asked respondents to recall and to respond to questions about “the couple and/or the family.” For counterbalancing, half of the sample were given questionnaires structured in the order “Part A \rightarrow Part B \rightarrow Part C” and the other half “Part C \rightarrow Part B \rightarrow Part A.” At the start of Part B, respondents were asked to freely describe the problematic circumstances they pictured. The following scales were used.

(1) Face sheet

We used the survey company’s respondent attribute data for age and sex. We included three other questions at the start of the questionnaire about a number of children, spouse cohabitation/non-cohabitation, and child cohabitation/non-cohabitation.

(2) Scale for measuring the difference in

couples

We asked for responses to a 22-item 5-point scale questionnaire formed by adding one item, “22. Difference in roles,” to the 21-item 5-point scale created by Wakashima et al. (2018) for measuring the difference in couples. This scale consists of three factors: “ways of thinking”, “preferences”, and “abilities”. We asked for responses here in Part A and Part B respectively. We used it because we thought that the differences between couples could be measured in three specific aspects. However, a negative bias between the couple could have arisen. Note that since the aim of this study is to investigate the difference that produces information in a couple from symmetry in the couple’s communication, we have not used this as a variable in testing our hypothesis.

(3) Scale on Symmetry and

Complementary in Conversation (SSCC)

We asked for responses to the 13-item 6-point scale created by Kobayashi (2012) for measuring symmetry in conversation. This scale is a single-factor structure. Higher total scores on this scale indicate conversational symmetry, whilst lower total scores indicate conversational complementarity. The instructional text was altered before use to ask the respondent to imagine the conversation with their spouse. "You will argue with your spouse until you are satisfied, even if you disagree with your spouse," are examples of items such as. We asked for responses here in Part A and Part B respectively.

(4) Communication scale

We asked for responses to the 14-item

7-point communication scale created by Wakashima et al. (2018). This scale uses twelve items of direct communication scale (Itakura, 2013), and two items assessing “how good/bad the relationship between the father and mother is” (namely: father and mother spend a lot of time talking with each other; father and mother often eat dinner together), which is a subscale of “interparental concordance scale for inquiring into mother-father relationships”(Hida & Kariya, 1992). This scale is a single-factor structure. Higher total scores on this scale indicate higher amounts of communication in couples. "1. talking about everyday relationships" is an example of an item. We asked for responses here in Part A and Part B respectively.

(5) Family Problem Solving Scale (FPSS)

We asked for responses to the 25-item 4-point family problem-solving scale created by Saito et al. (2020). A couple’s problem-solving ability is defined as “the skills possessed by a couple to make constructive progress through communication in the processes of periodically defining issues, clarifying the details, conceiving of solutions, making decisions, and implementing and testing solutions” (Saito et al. 2020). The scale is composed of two factors: “attitude to solve the problem” and “attitude to maintain the relationship”. "Attitude to solve the problem" refers to the propensity of couples to produce and execute solutions, communicate honestly with each other, and engage in collaborative problem-solving. "Attitude to maintain the relationship" refers to the tendency for couples

to talk peacefully and try to prevent the deterioration of the relationship by not arguing. Higher total scores for these base scales indicate greater problem-solving ability in a couple. We asked for responses here in Part C.

(6) Family resilience scale

We asked for responses to the 30-item 4-point family resilience scale created by Ohyama and Nozue (2013). Family resilience is defined as how a family recovers and remoulds as a family unit through critical circumstances (Walsh, 1998). This scale is composed of five factors: “connection”, “trust in family ability”, “balance between relationships and the individual”, “spirituality”, and “socioeconomic resources”. Higher total scores for these base scales indicate greater family resilience. We asked for responses here in Part C. Family resilience is a concept that broadly predicts how a family adapts, structured not only by the family’s problem-solving skills but also by notions such as how well the family is supported by the society around it, their ability to reframe unsolved problems in a positive light, and their ability to accept some problems as unsolvable. We used this scale to measure the holistic adjustment of the family. However, this study supposes that difference and interaction in a couple create amounts of information that are considered to increase the number of problem-solving strategies available to the couple; accordingly, when testing our hypothesis, we chose to use only the FPSS, which directly measures problem-solving skills.

(7) The item for measuring social desirability bias

We asked for responses to the notion that “generally, the couple needs to share the same opinions” in a 1-item, 4-point fashion, in order to measure social desirability bias in couples. We excluded from our analysis any participants who gave the response “4. Very applicable” to this question item. We asked for answers here after participants had finished responding to Part C.

(8) Manipulation checks

We asked for responses on a 3-item 4-point basis regarding the degree to which participants were able to picture “ordinary circumstances” in Part A, “circumstances in which the couple or family is facing an issue or problem” in Part B, and “the couple and/or the family” in Part C. We excluded from our analysis any participants who responded “1. Not at all” to one or more of the question items. We asked for responses here after participants had finished responding to the question item for measuring social desirability.

Ethical considerations

The survey was conducted anonymously. We paid consideration to informed consent and invasiveness, indicating at the beginning of the questionnaire that: the particulars of the survey and response thereto are voluntary; participants may refuse or stop providing responses; participants will suffer no loss even if they

refuse or stop providing responses; responses will be processed statistically and not be personally identifiable; and the results of the survey will be used solely for the purposes of research.

Results

We excluded from our analysis any participants that responded “4. Very applicable” to the question item for measuring social desirability (“generally, the couple needs to share the same opinions”), and any participants that responded “1. Not at all” to one or more of the question items in our manipulation checks regarding the circumstances that the questionnaire asked the participants to imagine. We thus excluded 31 participants from our analysis, leaving 281 analysis subjects. Table 1 shows the statistical values recorded for each scale.

Sorting the nature of the problems

On the basis of the free responses obtained for the “circumstances in which the couple or family is facing an issue or problem” as pictured in Part B, we sorted the nature of the problems described into six categories: “problems for the couple”, “problems for the family”, “problems for the individual”, “external problems”, “uncategorizable”, and

Table 1: Statistical values recorded for each scale

	n	min	max	M	SD
Ordinary: Symmetry	281	1.77	5.23	3.50	0.52
Problem: Symmetry	281	2.08	5.62	3.51	0.52
Ordinary: Communication	281	1.43	7.00	4.97	1.04
Problem: Communication	281	1.21	7.00	4.95	1.07
Solution-oriented attitude	281	1.06	4.94	3.29	0.68
Relationship-maintaining attitude	281	1.29	4.71	3.09	0.63

“no answer”. The “problems for the couples” group was categorized as those that are described as occurring between two parties with a spouse. The most common statements were about differences of opinion and sense of values with spouses and about marital conflicts. The “problems for the family” group categorized problems that are described as occurring between children and their parents’ generation and relatives, as well as problems that affect the whole family, such as the economic situation and caregiving issues within the family. The most common statements were about child care, the economic situation in the home, and parental care issues. “Problems for the individuals” group was categorized as those that were described as being problems that the respondents themselves were having. The most common statements were about the respondents’ own work troubles, mental instability, and health problems. “External problem” groups were categorized as those describing conflicts with persons outside the family or regarding social problems. The most common statements were descriptions of disasters. “Uncategorizable” group was categorized as those that are impossible to classify without a specific description of the problem.

Some responses were difficult to judge between being problems for the family or for

the couple, such as financial issues or matters relating to old age; we sorted such responses as “problems for the family”. Table 2 is a frequency distribution chart for each category. “Problems for the family” represents the majority of responses, at n=146, followed by “problems for the couple” at n=56, which covers 19.9%. In total, 71.9% of respondents pictured issues that arise within the household, i.e., “problems for the couple” or “problems for the family,” whilst only 1.4% of respondents pictured “external problems” such as natural disasters.

Examining the relationships between variables

We performed hierarchical regression analysis for ordinary and problem contexts respectively, using: solution-oriented attitude score and relationship-maintenance attitude score as dependent variables; and communication score, symmetry score, and an interaction term for both scores as independent variables. In order to reduce the risk of multicollinearity when adding the interaction term, we standardized the independent variable scores to have an average of 0 and a standard deviation of 1. Our method of analysis is as follows. In the first step, we added the communication score and symmetry score. In the second step, we added the interaction term for both scores, and tested the significance of

Table 2: Problem circumstance category frequency distribution chart

Category	Couple	Family	Individual	External	Uncategorizable	N/A	Total
n	56	146	10	4	2	63	281
%	19.9%	52.0%	3.6%	1.4%	0.7%	22.4%	100%

any increase in the coefficient of determination. Here, a significant increase in the coefficient of determination indicates that the influence of symmetry score on solution-oriented attitude score and relationship-maintenance attitude score varies according to communication score level. In order to check the significance of the interaction term, we obtained simple linear regression lines for communication scores with standard deviations of +1 and -1 respectively.

Table 3 shows the results of hierarchical regression analysis performed using ordinary-context communication and symmetry.

First, when we took solution-oriented attitude score as a dependent variable, and added ordinary-context communication score and symmetry score, communication score

($\beta=.59$, $p<.001$) showed a significant relationship. When we then added the interaction term for ordinary-context communication score and symmetry score, the variation of the coefficient of determination increased significantly ($F(1,277)=4.86$, $p<.05$), and the interaction term ($\beta=.11$, $p<.05$) showed a significant relationship for the two scores. Next, when we took relationship-maintenance attitude score as a dependent variable, and added ordinary-context communication score and symmetry score, significant relationships were shown for communication score ($\beta=.11$, $p<.05$) and symmetry score ($\beta=.38$, $p<.001$). Next, the variation of the coefficient of determination was not significant ($F(1,277)=1.16$, $p>.10$) when the interaction term for ordinary-context communication score

Table3: Hierarchical regression analysis for ordinary - context communication and symmetry

		<i>b</i>			
		Solution-oriented attitude		Relationship-maintaining attitude	
Step 1					
	Communication	.59 ***		.11 *	
	Symmetry	.02		-.38 ***	
Step 2					
	Communication x symmetry		.11 *		-.06
	<i>Adjust R²</i>	.35 ***	.37 ***	.14 ***	.14 ***
	ΔR^2		.01 *		.00

* $p<.05$ ** $p<.01$ *** $p<.001$

Table4: Hierarchical regression analysis for problem - context communication and symmetry

		<i>b</i>			
		Solution-oriented attitude		Relationship-maintaining attitude	
Step 1					
	Communication	.61 ***		.14 *	
	Symmetry	.03		-.41 ***	
Step 2					
	Communication x symmetry		-.05		-.22 ***
	<i>Adjust R²</i>	.38 ***	.38 ***	.17 ***	.21 ***
	ΔR^2		.00		.05 ***

* $p<.05$ ** $p<.01$ *** $p<.001$

and symmetry score was added.

Table 4 shows the results of hierarchical regression analysis performed using problem-context communication and symmetry.

First, when we took solution-oriented attitude score as a dependent variable and added problem-context communication score and symmetry score, a significant relationship was shown for the communication score ($\beta=.61, p<.001$). Next, when we added interaction term for problem-context communication score and symmetry score, the variance of the coefficient of determination was not significant ($F(1,277)=1.22, p>.10$). Next, when we took relationship-maintenance attitude score as a dependent variable and added ordinary-context communication score and symmetry score, significant relations were shown for communication score ($\beta=.14, p<.05$) and symmetry score ($\beta=.41, p<.001$). Next, when

we took relationship-maintenance attitude score as a dependent variable and added the interaction term for problem-context communication score and symmetry score, the variance of the coefficient of determination increased significantly ($F(1,277)=16.55, p<.001$), and a significant relationship was shown for the interaction term ($\beta=-.22, p<.001$).

Lastly, in order to check the interaction term, we obtained simple linear regression lines from a regression equation using communication scores with standard deviations of +1 and -1 respectively. These results suggest that, in couples which in ordinary contexts have more communication, greater symmetry will mean a greater solution-oriented attitude (Figure 1). Furthermore, in couples with less symmetry in problem contexts, more communication will mean greater relationship-maintaining attitude (Figure 2).

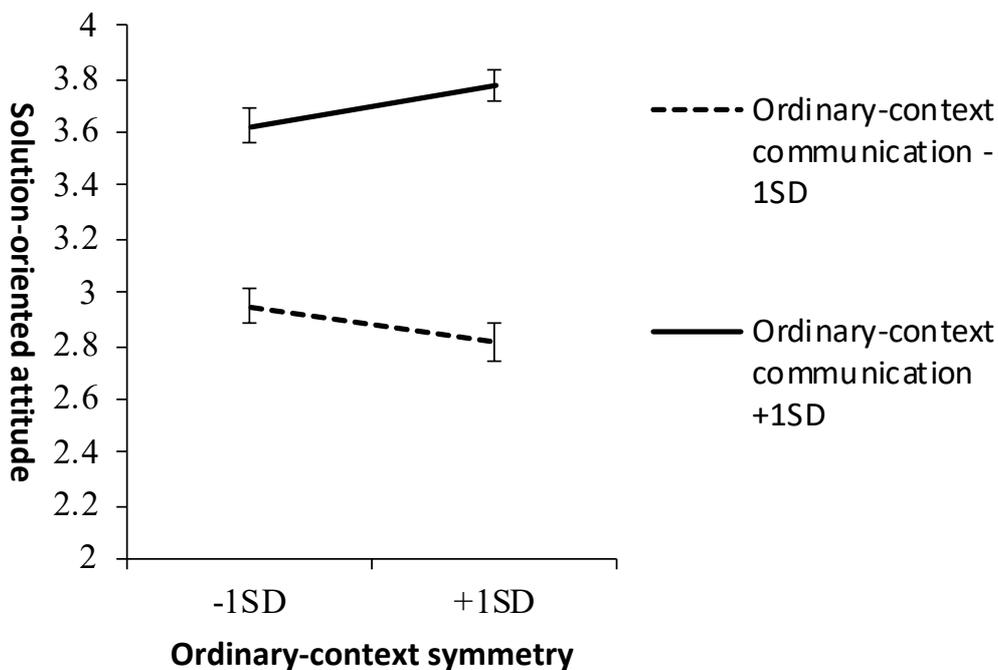


Figure 1: Interaction effect between ordinary-context communication and symmetry

Discussion

This study applied the Integrated Information Theory (IIT) schema to family systems, controlled between ordinary and problem contexts, and examined the effect exerted by communication amount and symmetry between couples on problem-solving ability. Below, our hypothesis will be considered from the perspectives of solution-oriented attitude and relationship-maintaining attitude.

Examining factors related to solution-oriented attitude

Our examination of solution-oriented attitude indicated that greater symmetry means a greater solution-oriented attitude for more communicative couples in ordinary contexts. Accordingly, couples with greater symmetry

and more ordinary-context communication may have a better capacity for solution-devising and decision-making. These results support the hypothesis that greater symmetry will indicate greater problem-solving ability in more communicative couples in ordinary contexts. In Integrated Information Theory, as described by Tononi (2004), the phenomenon of consciousness (information amount) is created by *interaction* (integration) and *difference* (diversity) amongst neurons. In this research, we applied this IIT schema to a study of the family, and examined (1) symmetry as the *difference* in the family, (2) amount of communication as the *interaction* in the family, and (3) problem-solving ability as the product created by *difference* and *interaction*. Wakashima et al (2018) measured difference

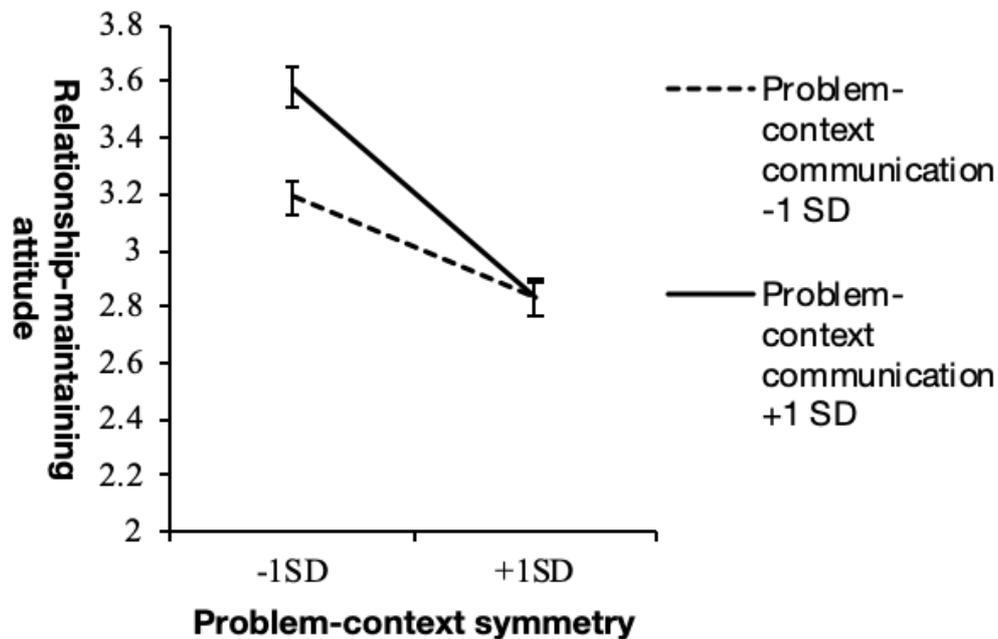


Figure 2: Interaction effect between problem-context communication and symmetry

from three facets, namely “ways of thinking,” “preferences,” and “abilities,” but this approach was problematic due to the possible influence of negative bias on the responses from the couples. In this study, we measured the *difference* in the couple through communication symmetry and complementarity, so as to avoid the influence of negative bias insofar as possible. Complementary communication indicates consensus in the opinions of a couple; one spouse makes a suggestion, and the other spouse accepts that suggestion. Meanwhile, symmetrical communication indicates that the spouses present differing opinions and a new perspective may arise from their differing views. The results of our study prove that, in ordinary contexts, couples that communicate more, and more symmetrically, will have the greatest amounts of information, thus having a positive influence in the division of solutions and in decision-making.

Meanwhile, in problem contexts, only the communication amount positively influenced solution-oriented attitude, and symmetry had no relation. Conceivably, this is related to the nature of the problems pictured by respondents in our study. “Problems for the couple” between spouses, and “problems for the family” such as childcare and family finances, and familial connections in old age, represented 71.9% of all responses in this study. These familial and spousal problems are issues that arise within the family system. Meanwhile, “external problems” such as natural disasters and accidents can be understood as issues that arise outside of the family system. While

reaching a consensus amongst the family’s views and strengthening bonds can itself be an effective means for solving issues that arise within the family system, for problems that arise outside of the family system it may be more effective to have family members conceive of a large number of possible solutions. In other words, less information is required to solve family-internal problems than family-external problems. Since the majority of the problems recalled in our study were family-internal, in problem contexts communication amount was the only factor to positively influence solution-oriented attitude. In future research it will be necessary to test our hypothesis having controlled for the nature of the problem (i.e., whether it arises within or outside of the family system).

Examining factors related to relationship-maintaining attitude

Our examination of relationship-maintaining attitude indicated that more communication means greater relationship-maintaining attitude for complementary couples in problem contexts. Accordingly, couples with less symmetry and more problem-context communication may have less conflict in problem-solving. Symmetry involves repeating assertions that conflict with the other partner, and thus whilst this increases the amount of information within the couple, there is also the possibility of a negative influence being exerted on the relationship between the two spouses. In fact, regardless of context, symmetry showed a negative influence on relationship-maintaining attitude. In complementary couples, there will

be more communication in which one spouse accepts the other's assertions, which stabilizes the couple's relationship from the perspective of relationship-maintaining attitude. As discussed above, if the nature of the problem facing a family is internal to the family system, then stabilizing the couple's relationship itself can be an effective means of solution.

However, if complementary roles become fixed, the ideas of only one spouse are always used, therefore leading to lower amounts of information. Greater amounts of information may be required for problems external to the family system; when facing such problems, maintaining the couple's relationship may not constitute an effective means of solving the issue. Thus, whilst we can say that it is important to have less symmetry and more communication, when the aim is led by a relationship-maintaining attitude, i.e., stabilizing the couple's relationship, there is nonetheless a need for the detailed investigation into the role played by relationship-maintaining attitude in a couple's problem-solving ability after having controlled for the nature of the problem.

Conclusion

The purpose of this study was to apply Integrated Information Theory to the family system. We thus investigated the influence exerted on the problem-solving ability by how much and how symmetrically a couple communicates. Our results show that the study's hypothesis is supported only in ordinary contexts in which solution-oriented attitude is

taken as a dependent variable. Meanwhile, the hypothesis found no support in ordinary contexts in which relationship-maintaining attitude is taken as a dependent variable, nor in problem contexts.

One issue with our study is the bias in the nature of the problems recalled by our respondents. We did not control for the nature of the problems recalled by our respondents for problematic contexts. As a result, in 71.9% of cases, respondents recalled problems that arose within the family system. If the setting of a problem is outside of the family system, more information is required to solve the issue than in family-internal settings. This means that whilst increased communication and relationship maintenance may themselves be effective means for solving problems within the family system, family-external problems require not only more communication but also the creation of symmetrical communication patterns and the conception of numerous possible solutions. In future research, it will be necessary to test the hypothesis after having controlled for the nature of the problem. Additionally, although more symmetrical and communicative couples may have better problem-solving ability, if they become too symmetrical then relationship maintenance becomes difficult, which thereby lessens problem-solving ability. Looking to the future, further investigation may be needed into the connection between a couple's solution-oriented attitude and relationship-maintaining attitude.

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A pilot study to assess positive and negative post-divorce parental disclosures

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ABSTRACT. Post-divorce parental disclosures(P-DPD), in which parents tell their children about their ex-spouse after a divorce, has an impact on the parent-child relationship. Previous research has assumed that P-DPD is negative. The present study aimed to develop a parental disclosure scale that includes positive aspects. Additionally, we investigated the effects of parental disclosure on children's mental health. Sixty-one Japanese participants who experienced parental divorce were asked to respond to the parental disclosure scale, as well as the parental affinity scale, mental health scale, and items on socio-demographic information. The results indicated that the factor structure of the P-DPD scale included 19 items and two factors. The P-DPD scale showed adequate internal reliability. Although positive parental disclosure did not directly affect children's mental health, it indirectly improved mental health through the affinity to the live-in parent. Further, only in the group with interaction with the separated parent did negative parent disclosure increase the affinity for the separated parent. These results suggest that positive parental disclosure is important in Japan. The P-DPD scale that assessed both positive and negative aspects could be expected to be used to determine the quality of the parent-child relationships after divorce.

KEY WORDS: *Divorce, Parental disclosure, Parent-child relationship, Children's affinity with parents*

Introduction

Divorce affects not only both the spouses but also the mental health of their children. The impacts of divorces on children's mental development vary with the age of the child; for the cases of young children, regressive phenomena, anxiety, and abusive behavior are commonly seen (Wallerstein & Kelly, 1975). Even ten years after their parents' divorce, many children retain vivid memories of that time and continue to have grief, resentment toward their parents, and a sense of loss (Wallerstein, 1985).

Children from divorced families particularly show sadness, anxiety, and anger, especially at their parents, and carry concerns about their life and financial situation after the divorce (Odagiri, 2005). Other researchers have reported that the effects of parental divorce on children are short term (Hetherington, 1984, 1990; Furstenberg & Cherlin, 1991; Gately & Schwebel, 1992).

In Japan, the number of divorces has been declining since 2003. Meanwhile, we note that divorce between spouses with minor children accounts for 58.1% of the total (Ministry of Health, Labour and Welfare of Japan, 2018). More than 60% of divorced men and women say their divorce has caused them worries about their children (Ministry of Health, Labour and Welfare of Japan, 1997). In a 2016 survey, the

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number of single-parent households in Japan was estimated at 1.42 million, with divorce being the most common reason for the single-parent status (Ministry of Health, Labour and Welfare of Japan, 2017). In the post-divorce family, one of the major issues is how to deal with the children. The relationship between the separated parent and the child is another challenge for post-divorce families. In Japan, when parents divorce, in many cases, the children live with their mothers (Ministry of Health, Labour and Welfare of Japan, 2017). In single-parent households, even if there is no relationship with the father after the divorce, the memory of the father remaining in the home has a significant impact on the family, and “how the mother talks about the father” is important in shaping the child’s perception of the father; the mother often unconsciously strengthens the mother–child union by making the father the “bad guy” (Horita, 2005).

Parental disclosure is defined as the verbal communication of personal, confidential, or hitherto unknown information by parents to their children (Donovan, Thompson, LeFebvre, & Tollison, 2016). It plays an important role in the parent–child relationship, but its impact on child development and parent–child relationships varies in the literature. Studies have formulated the concept of post-divorce parental disclosures (P-DPD), in which the custodial/live-in parent discloses to the child the matters (mainly negative information) caused by the divorce. P-DPD from mothers to their daughters in single-parent households that experienced divorce within the past two years include (1) financial

problems, (2) details on the divorced father, (3) ups and downs of the mother’s job, (4) parenting issues, and (5) personal concerns (Koerner, Wallace, Lehman, & Raymond, 2002; Koerner, Wallace, Lehman, Lee, & Escalante, 2004). These five disclosures are associated with high psychosomatic symptoms in daughters, and talking in depth and in detail about financial problems, parenting issues, and personal worries tends to be significantly associated with low mother–child intimacy (Koerner et al., 2002). The finding that a daughter’s worry about her mother mediates P-DPD and the daughter’s psychosomatic symptoms suggests that daughters who receive P-DPD exhibit anxiety, depression, and psychosomatic symptoms as a result of their worry about their mother. In addition, studies have found an association between psychosomatic symptoms and problem behaviors in children, regardless of sex (Koerner et al., 2004).

Children who experienced parental divorce often suffer from loyalty conflicts and tend to lean on one parent to avoid these conflicts (Arditti, 1999; Golish, 2003; Koerner, Jacobs & Raymond, 2000). In some cases, negative P-DPD has led to the formation of parent–child coalitions and high levels of closeness and satisfaction with the live-in parent (Afifi & McManus, 2010). When P-DPD contains negative information, when it contains details that harm the other parent, when it is not developmentally appropriate information, or when it forces the child to act as a mediator or sounding board for both parents or to judge which of the parents is correct, it has a negative

impact on the child (Afifi, McManus, Hutchinson, & Baker, 2007). Whether a child perceives P-DPD as positive or negative is important (Afifi et al., 2010). P-DPD can be helpful if the information helps the child understand events within the family (Toller & McBride, 2013), reduces the child's anxiety and uncertainty (Afifi & Schrodt, 2003), or gives the child the opportunity to get to know their parents, learn about themselves, and better understand the rules, roles, and values of the family (Dolgin, 1996; Koerner, et al., 2004).

One of the most negative effects of parental divorce on children is the fact that the conflict between parents continues after the divorce (Odagiri, 2010). To help children adjust to the major changes that come with their parents' divorce, it is important that both parents (1) tell the child together, (2) refrain from making negative comments about the ex-spouse in the presence of the child, (3) emphasize that the divorce is not the child's fault, (4) explain the reasons for the divorce in broad terms without going into detail, and (5) address the child's questions and doubts (Gumina, 2009). A similar view has been expressed in Japan (Supreme Court of Japan, 2014). Recent parental disclosures research has focused on parents' attitudes toward parental disclosures (Kang, Ganong, Chapman, Coleman, & Ko, 2017; Kang & Ganong, 2020). Parents are concerned about involving their children in parental issues through parental disclosures. They also recognize that negative parental disclosures may harm their children (Kang et al., 2017).

To be brief, previous P-DPD studies have

examined the negative results of parents disclosing information to their children and, furthermore, how one can suppress such negative ones and turn the discourse to the positive chances for the future adjustment of children. The results of these studies have contributed to our understanding of post-divorce family communication issues. However, as it depends on how the child perceives it, concerns about the negative impact of P-DPD on children remain, and some parents may be hesitant to engage in P-DPD. If the content of the P-DPD is positive and benign for both parents and children, it will be better received. However, the impact of positive parental disclosures, as shown by Gumina (2009) and the Supreme Court of Japan (2014), has not been investigated. In addition, studies dealing with Japanese families have shown that mothers communicate in a way that allows them to mediate between the father and the child (Toda, Makino, & Sugawara, 2002; Itakura, 2010).

The present study focused on how parents tell their children about their marriage and their former spouse after divorce. Particularly in Japan, there is a stereotype that it is difficult for parents to cooperate in raising children after divorce and that it is better for the separated parent to watch over their children's growth from afar (Odagiri, 2010). Therefore, it is conceivable that a live-in parent is unlikely to tell a child about a separated parent. However, in Japan, just as mothers mediate between children and fathers (Toda et al., 2002; Itakura, 2010), indirect communication influences the relationship between children and parents. Thus,

it is conceivable that the live-in parent's positive talk about their ex-spouse may enhance the children's mental health and change their own perceptions of their ex-spouses. From the backgrounds, the study is aimed to create a P-DPD scale to measure parental disclosures, including positive parental disclosures (PPD), and clarified the impact of PPD and negative parental disclosures (NPD) on children's mental health via perceptions of parents.

Methods

Participants

This study included 13 male and 48 female participants who experienced parental divorce.

Procedures

The participants were invited offline and online both. On social media, we asked managers of closed communities targeting offspring who experienced the divorce of their parents to cooperate in the survey and invited users to participate. No monetary compensation or other incentive for participating was given. Those who expressed interest in participating in the study were directed to an online survey platform.

This study was not reviewed by a research ethics review committee because there was no ethics review committee at the time this study was conducted. Nonetheless, this study adhered to the Guidelines for Good Clinical Practice and norms of the 2002 Declaration of Helsinki.

Measures

Post-divorce parental disclosure scale

Based on Koerner, Wallace, Lehman, Lee, and Escalante (2004), Afifi and Afifi (2009), and Afifi and McManus (2010), we prepared 25 items on topics related to separated parents: 15 items on PPD and 16 items on NPD. For each item, the current frequency was asked using the four-item scale from 1 (*never*) to 4 (*frequently*). The questionnaire contained the following instruction. The live-in parent is denoted by "X" and the separated parent is denoted by "Y." If the live-in parent is the mother, please answer by adding "your mother" to "X" and "your father" to "Y" (example: X (your mother) tells me that Y (your father) will still cherish me after the divorce.). If the live-in parent is the father, please answer by adding "your father" to "X" and "your mother" to "Y."

Parental affinity scale

The parental affinity scale (Toda et al., 2002) is a 10-item self-reported scale that has two subscales: "affinity with father" (five items, e.g., "I like my father") and "affinity with mother" (five items, e.g., "I respect my mother"). The two items of "I have a good relationship with my mother" and "I have a good relationship with my father" were modified to "I am satisfied with my relationship with my mother" "I am satisfied with my relationship with my father," respectively, to target those who had experienced a divorce. These items were each rated on a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Rather than summarizing the scores as those for fathers and for mothers, we summarized them according to live-in and separated status.

Mental health

The Cornell medical index (Brodman, Erdmann, Lorge, Wolff, & Brondbent, 1949) for depression (9 items), anger (9 items), and anxiety (6 items) was used for the indicators of mental health. For each symptom, the participants were asked to choose between 2 (*yes*) and 1 (*no*). A lower score indicated better mental health.

Socio-demographic information

We asked participants to provide their sex, age, age when parents divorced, years since their parents' divorce, parental authority, parents' remarriage, interaction with separated parent, and current economic situation.

Statistical analyses

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed using Mplus version 8.1 (Muthén & Muthén, 2017). EFA was performed using weighted least squares with adjusted means and variance (WLSMV) and based on eigenvalues >1. We also performed EFA with promax rotation to test the theoretical structure of the P-DPD scale. CFA was also performed using WLSMV.

We used the following fit indices to evaluate the confirmatory factor analysis model: root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker–Lewis Index (TLI), and weighted root mean square residual (WRMR). Goodness-of-fit indices were estimated with criteria given by Hu & Bentler (1999) and Yu (2002). For the hypothetical model of parental disclosure's impact on mental health, we did not determine the goodness of fit

of the hypothetical model because we chose the saturation model.

Other analyses were conducted using R 3.6.0 (R core team, 2019). α and correlations between the P-DPD scale and other measures were established by calculating Pearson's correlation coefficients. All statistical analyses used two-tailed tests. Pairwise deletion was used for missing data.

Result

Table 1 gives the participants' socio-demographic information. Of the 61 participants, most were female (78.7%) and in their 20s (55.7%).

In the EFA, a scree plot of the eigenvalues was constructed and showed a strong support for the two-factor structure. We identified a total of two factors with eigenvalues larger than 1.00. Based on the standard factor loading of equal to or greater than .35 without cross loading, we eliminated six items from the 25-item scale after examining the pattern matrix of the promax rotation. In Table 2, the factor loadings of the scale are represented.

As suggested by EFA, the two-factor model was proposed in the CFA. The goodnesses-of-fit were good: CFI, .984; TLI, .982; RMSEA, .076 (CI: .046–.101); WRMR, .949 (Table 2). The reliability coefficients were sufficiently high for positive ($\alpha = .916$) and negative disclosure ($\alpha = .812$).

The correlations between the P-DPD scale and other scales were estimated, of which the coefficients are presented in Table 3. PPD showed a significantly positive correlation with

Table 1 Participants' characteristics

	N (%)
Sex	
Male	13 (21.3%)
Female	48 (78.7%)
Age (years)	
10s	11 (18.0%)
20s	34 (55.7%)
30s	14 (23.0%)
40s	2 (3.3%)
Age when parents divorced (years; $n = 60$)	$M = 10.4$ ($SD = 6.03$)
Number of years since parents' divorce (months; $n = 60$)	$M = 184.52$ ($SD = 115.92$)
Parental authority	
Father	17 (27.9%)
Mother	39 (63.9%)
Other	5 (8.2%)
Remarriage	
Father	
Yes	23 (37.7%)
No	26 (42.6%)
Unidentified	12 (19.7%)
Mother	
Yes	17 (27.9%)
No	39 (63.3%)
Unidentified	5 (8.2%)
Interaction with separated parent	
Have	31 (50.8%)
Not have	30 (49.2%)
Economic situation	
Very wealthy	3 (4.9%)
Wealthy	12 (19.7%)
Neither	27 (44.3%)
Somewhat poor	12 (19.7%)
Very poor	7 (11.5%)

affinity with the live-in parent (ALP) ($r = .42$). ALP showed a significantly negative correlation with mental health ($r = -.59$). Number of years since parents' divorce was significantly correlated with affinity with the separated parent (ASP) ($r = -.64$).

Structural equation modeling was tested to investigate the impact of P-DPD on mental health (Figure. 1). In both groups with and without interaction with the separated parent, PPD increased ALP (interaction with the separated parent, $\beta = .49$, $p < .01$; no interaction with the separated parent $\beta = .47$, $p < .01$), and ALP was associated with better mental health (interaction with the separated parent $\beta = -.65$, $p < .001$; no interaction with the separated parent $\beta = -.44$, $p < .01$).

In addition, NPD increased ASP only in the group that had interaction with the separated parent ($\beta = .37$, $p < .01$).

Discussion

This study developed a P-DPD scale and assessed the impact of parental disclosure on children's mental health. Factor analyses confirmed the two-dimensionality of the scale for positive disclosure and negative disclosure. Previous parental disclosure scales (Koerner et al., 2004; Afifi et al., 2009; Afifi et al., 2010) consisted of items related to negative content. With the addition of items related to positive content, our P-DPD scale could measure both aspects. Especially, in Japan, positive talk by the mothers about the fathers has been found to increase children's affinity with their father (Toda et al., 2002). Therefore, the P-DPD scale allowed the measurement of the impact of the positive narrative by the live-in parent regarding the separated parent on the children.

The α coefficient in our P-DPD scale yielded sufficient values, which suggests adequate reliability. However, the validity was not

Table 2 Factor Loadings for the P-DPD scale

Items	Standardized loadings			
	EFA		CFA	
	F1	F2	F1	F2
Positive parental disclosure				
19 X tells me that Y will still cherish me after the divorce.	.994	-.176	.976	-
16 X tells me clearly that I am always free to meet Y after the divorce.	.973	-.330	.969	-
14 X tells me clearly that I can interact freely with Y after the divorce.	.964	-.265	.956	-
18 X tells me that Y is always thinking of me even after the divorce.	.914	-.172	.897	-
17 X tells me clearly that my relationship with Y will not change even after the divorce.	.896	-.160	.892	-
15 X tells me clearly that Y's love for me will not change even after the divorce.	.827	-.214	.836	-
7 X tells me about Y's current relationships (remarried, not remarried, etc.).	.803	.325	.829	-
6 X tells me about where Y currently lives.	.755	.326	.798	-
4 X talks to me about how Y is doing currently.	.738	.362	-	-
2 X tells me happy memories with Y.	.738	.045	.726	-
5 X tells me about Y's hobbies, which Y was doing when they were married.	.684	.476	-	-
3 X positively talks to me about their memories of their marriage.	.626	.002	.559	-
Negative parental disclosure				
12 X tells me that it is Y's fault that they have divorced.	-.055	.934	-	.934
13 X tells me about their dissatisfaction with Y.	-.058	.930	-	.929
11 X talks to me about how terrible they felt being with Y.	-.012	.915	-	.921
23 X tells me that Y doesn't care about me and X.	-.147	.910	-	.847
21 X tells me that it does no good to meet with Y.	-.420	.902	-	-
8 X tells me about how Y disappointed them.	.087	.894	-	.917
22 X says that Y does not need to know how I am doing.	-.351	.888	-	-
24 X shows me that Y is currently unable to see me.	-.114	.854	-	.815
9 X tells me that their marital relationship was not good since before.	.110	.810	-	.832
25 X told me "I divorced for your sake."	.052	.717	-	.736
20 X tells me that I am not the cause of their divorce.	.582	.597	-	-
10 X talks to me about how they got divorced, mentioning each other's reasons.	.332	.576	-	.654
1 X tells me about Y at the time of their marriage.	.464	.496	-	-

Note: X indicates the live-in parent and Y indicates the separated parent. Bolding indicates placement on a given factor.

Table 3 Descriptive statistics of the P-DPD Scale

	Pearson's correlation coefficients							
	Mean	(SD)	NPD	ALP	ASP	MH	Contact with separated parent	Years since divorce (n = 60)
PPD	14.38	(6.04)	.07	.42**	.25	-.25	-.16	-.29
NPD	16.79	(7.31)	-	-.09	.13	.12	.07	.00
ALP	14.79	(5.99)		-	-.04	-.59***	-.11	.05
AEP	12.54	(5.63)			-	.07	-.17	-.64***
MH	10.20	(5.28)				-	.11	-.08

Note: PPD = Positive parental disclosure, NPD = Negative parental disclosure, ALP = affinity with the live-in parent, ASP = Affinity with the separated parent, MH = Mental health.

** $p < .01$, *** $p < .001$.

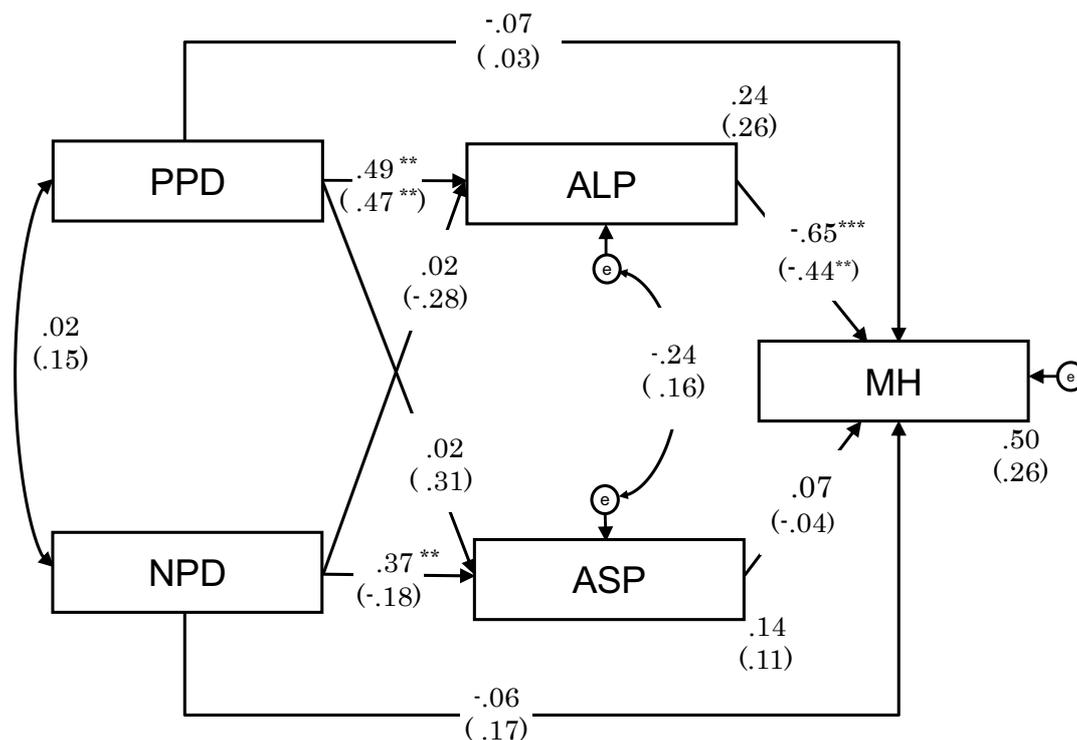


Figure 1. Effect of parental disclosure on the offspring's mental health model. Note: PPD = Positive parental disclosure, NPD = Negative parental disclosure, ALP = affinity with the live-in parent, ASP = Affinity with the separated parent, MH = Mental health. Results at top for interaction with the separated parent group and in parentheses for no interaction with the separated parent group.

** $p < .01$, *** $p < .001$.

sufficiently examined. It will be necessary to consider the relevance of the P-DPD scale in the future. Regarding the impact of parental disclosure on children, our results revealed that PPD indirectly improved mental health through ALP. Gumina (2002) strengthened the importance of the way the live-in parent communicates with their children over the divorces in the past. Our study showed that providing PPD, rather than not providing NPD, may indirectly enhance the mental health of children.

Meanwhile, the lack of effects of NPD on live-in parents (Koerner et al., 2002) may have been influenced by the fact that the divorce of our participants' parents occurred 15 years in the past. This may also explain the view that the effects of parental divorce are short term (Hetherington, 1984, 1990; Furstenberg & Cherlin, 1991; Gately & Schwebel, 1992).

The present results showed that NPD increased ASP only in the group with interaction with the separated parent. In the absence of interaction with the separated parent, information conveyed by the live-in parent and memories of the pre-divorce home create the image of the separated parent (Hotta, 2005). Meanwhile, when there is interaction with the separated parent, the child creates an image of the separated parent from meeting the separated parent (Odagiri, 2005, 2010). If the child wants to interact with the separated parent, he or she could perceive the high NPD of the live-in parent as a refusal to interact with the other parent or develop feelings of disgust towards the live-in parent. Thus, there may be a relative

increase in ASP due to rebelliousness against the live-in parent. However, our study did not examine whether children wanted to interact with their separated parent or how children perceived parental disclosure. Therefore, future studies should be conducted that include these variables.

Limitations

The present study has a number of limitations. First, the number of participants was small and the attributes were not uniform. Our participants were half in their twenties, and on average, their parents had been divorced for more than fifteen years. Therefore, the frequency and content of parental disclosure by the live-in parent and the way the child perceived it may be different from that immediately after the divorce. In addition, although the present analysis was based on the classification of live-in and separated parent, the frequency of parental disclosure may differ between live-in parents who are mothers and fathers. Furthermore, 78.7% of the participants were female. It is necessary to verify whether there are differences by gender. In the future, after controlling for the attributes of the participants, parental disclosure ought to be investigated by dividing it into cases where the live-in parent is the father or the mother.

Second, we did not take into account how children perceived parental disclosure, as noted above. Children may perceive PPD negatively based on nonverbal information, such as when the live-in parent makes facial expressions that could be deemed contradictory to their spoken PPD. Future research should also investigate how children assessed the parental disclosure of

their live-in parents.

Third, as we used a saturated model to test the hypothetical model, we could not show goodness-of-fit. Since the saturation model is completely dependent on a particular data set and its properties, we should consider the goodness-of-fit of the hypothetical model in future studies.

Conclusion

This study developed a P-DPD scale that contains positive elements overlooked in previous studies, and has demonstrated sufficient internal consistency. The scale shown that PPD indirectly enhanced children's mental health. These findings contribute to the extension of the concept of P-DPD, which had previously been assumed to be negative. Further, the development of this research will lead to the identification of ways in which children can develop good relationships with their separated and live-in parents after divorce.

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Family Structure and Adolescent Eating Disorder Tendencies

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ABSTRACT. The current study examined (a) the current status of eating problems (eating disorder tendencies: EDT) in Japanese adolescents and (b) the association between adolescent EDT and a family structure consisting of three dyadic subsystems (marital, father-adolescent, and mother-adolescent). Participants were 663 high school and university students (341 males and 322 females) in Japan who completed a self-report questionnaire. Survey results revealed that 19 out of 341 males (5.57%) and 53 out of 322 females (16.46%), or 72 out of 663 participants (10.86%) in the entire sample, were categorized as having EDT according to the EAT-26. The male-to-female ratio of participants with EDT was 1 to 2.8. Many of the female adolescents with lower EAT-26 scores had a highly cohesive family structure with a balance of power in all dyads. The current findings suggested that adolescent eating problems are related to an unbalanced family structure. The clinical implications of these findings for family therapy are discussed.

KEY WORDS: family structure, adolescent eating problems, eating disorder tendencies

Introduction

In the field of psychosomatic disease, eating disorders are a prevalent stress reaction in adolescence (Garner & Garfinkel, 1997). Adolescents with eating disorders have long been treated with psychotherapy in Japan. A core component of an eating disorder is a fixation upon eating in relation to a distorted body image. Eating disorders often develop in the teens to early 20s and are more prevalent in females (American Psychiatric Association, 2013). Anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED) are the most common eating disorders and cause

serious health problems for adolescents.

An eating disorder has no single cause and develops as a result of the complex interaction of several factors; biological, psychological and social factors all play a part (American Psychiatric Association, 2013; Garner & Garfinkel, 1997). Some studies have claimed that family relationships play a significant role as a risk factor for and as a factor protecting against the development of eating disorders and eating problems. Some clinicians and researchers have addressed this problem and developed therapeutic techniques by examining the association between family relationships and eating problems (e.g., Selvini-Palazzoli, 1974; Minuchin, Rosman, & Baker, 1978; Fish & Schlanger, 1999).

Previous studies involving clinical samples took the approach that family relationships

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were related to recovery from and worsening of an eating disorder. For example, a good prognosis for an adolescent eating disorder is associated with improved family functioning (Woodside, Lackstrom, Shekter-Wolfson, & Heinmaa, 1996) and a positive view of family relationships (Wewetzer, Deimel, Hertz-Dahlman, Matthejat, & Remschmidt, 1996). From a therapeutic point of view, family therapy has been found to be particularly effective in treating youth diagnosed with non-chronic AN (e.g., Minuchin et al., 1978; Russell, Szmukler, Dare, & Eisler, 1987; Stierlin & Weber, 1989).

However, the fact that adolescent eating disorders are not attributable to family relationships needs to be discussed. Garner (1993) pointed out the vicious cycle in which symptoms are maintained through stressful life events, dieting, and feedback from others, based on individual factors such as psychological, genetic, physical, and biological factors, dysfunctional family relationships, and cultural factors as evinced by a desire to be thin. In addition, Minuchin, Nichols, & Lee (2007) argued that the cyclical interaction of family relationships causes stress within the family that induces a physiological response, exacerbating an eating disorder in adolescents. Therefore, the pathology of an eating disorder in adolescents might be exacerbated by some specific family interactions or relationships based on personal vulnerability. Dysfunctional family interactions and relationships might be a result of an eating disorder rather than a cause. Thus, some adolescents may have eating

problems regardless of their family relationships. The interaction between family relationships and adolescent eating problems needs to be discussed.

Adolescents with eating problems might not seek medical attention even though they have an eating disorder (Nakai, 2000, 2003, 2010; Nakai, Sato, Tamura, Sugiura, & Hayashi, 2003; Nakai, Sato, Tamura, Sugiura, & Hayashi, 2004), so surveys of the general population are important. Nakai et al. (2004), for example, reported that one-third to one-half of female adolescents and one-fifth of male adolescents had eating problems. Moreover, Nakai (2010) conducted a large-scale survey of female high school and university students in 1982, 1992, and 2002. Nakai reported that (1) the number of under-weight or over-weight adolescents, (2) the percentage of the adolescents desiring to be thin, (3) eating problems, such as limited food intake, binge eating, and purging, (4) the frequency of amenorrhea, and (5) the estimated incidence of eating disorders all increased. Several studies also noted that an eating disorder was likely to develop from a desire to diet (e.g. Kobayashi & Kurita, 2005). These findings suggest that typical female adolescents might develop an eating disorder and that an eating disorder might prolong eating problems. Hence, eating problems are an important subject that require a broader understanding of the psychological and social context beyond the framework of a psychiatric disorder, i.e. whether an eating problem meets diagnostic criteria.

As noted in the beginning of this paper,

eating problems are a pathology that develops through the complex interaction of several factors, such as biological, psychological, and social factors (American Psychiatric Association, 2013; Garner, 1997). Family relationships that adolescents encounter in their everyday lives and that continue throughout their lives are particularly important environmental factors. When severe, eating problems are likely to threaten the lives of adolescents, so family relationships are more of an issue for adolescents. Accordingly, adolescent eating problems might foster negative family relationships (Archibald, Linver, Graber, & Brooks-Gunn, 2002). In any case, the family relationships of adolescents with eating problems need to be examined to understand the process by which an eating problem develops and progresses and its prognosis and to facilitate prevention and support.

Minuchin et al. (1978) is a leading study that exhibited a comprehension of psychosomatic disorders arising from the interaction of family relationships and that described a theoretical system of treatment. Minuchin suggested that families of patients with psychosomatic disorders were characterized by (1) enmeshment, (2) parental over-involvement, (3) rigidity, and (4) an inability to resolve conflicts, and he pointed out that a pattern of dysfunctional family interaction promoted somatization. He also proposed an important concept of the boundary between sub-systems such as the marital dyadic relationship or mother-child dyad, and he suggested that

violation of that boundary led to the enmeshment of family members. Moreover, Minuchin et al. (2007) also argued that the cyclical interaction of family relationships exacerbated illness, i.e. that stress within the family exacerbated symptoms. In Japan, Kobayashi & Kurita (2005) surveyed female adolescents and indicated that adolescents with eating disorder tendencies (EDT) feel highly stressed within interpersonal relationships, including pressure from parents.

Several previous studies that investigated the association between EDT and family relationships in non-clinical samples indicated that authoritarian parents (Abrantes, Strong, Ramsey, Lewinsohn, & Brown, 2006), unstable family relationships (McGuire, Story, Newmark-Sztainer, Halcon, Campbell-Forrester, & Blum, 2002) or conflicted family relationships (Byely, Archibald, Graber, & Brooks-Gunn, 2000) were associated with EDT, such as dieting and concern about one's body image. In contrast, Mellin, Neumark-Sztainer, Story, Ireland, & Resnick (2002) found that family cohesion suppressed unhealthy eating by obese adolescents. Several studies have focused on a single dyadic relationship, such as the father-adolescent dyad or the mother-adolescent dyad. Kobayashi & Kurita (2005) reported that adolescents with EDT received less social support from their fathers, and Katena, Imai, & Shimazaki (2004) noted that father over-involvement to some extent suppressed the EDT of adolescents. A mother's values, appearance, or concern about her body type (Mukai, 2010) and a mother's attitudes about

eating (Saito, 2004) were found to be associated with adolescent EDT.

Although previous studies focusing on the association between family relationships and EDT noted the importance of family relationships, those studies merely examined the association between EDT and a single dyad, such as the father-child dyad or the mother-child dyad. If one views a group, i.e. the family, as “a system based on complex interactions” (e.g. Hasegawa, 1987), then dyads that facilitate other dyads, i.e. the marital dyad facilitating the father-child dyad or the mother-child dyad, need to be examined comprehensively and in detail.

Thus, the current study focuses on how adolescents view and experience relationships with their family (Shimosaka, 1988; Katena et al., 2004), and this study views the family as a combination of three dyadic sub-systems (marital dyad, father-adolescent dyad, and mother-adolescent dyad) from an adolescent’s viewpoint. This study views EDT as an indication of adolescent maladaptation and it examines the association between EDT and family structure.

Several recent studies investigated male adolescent EDT (Hayano, 2002) and examined sex differences in the desire to be thin (Uragami Kojima, Sawamiya, & Sakano, 2009). Hayano (2002), for instance, reported that the ratio of males with EDT was one-third that of females in a survey of 245 male university students. Nevertheless, few studies have reported the current status of EDT in both males and females. Thus, reporting EDT in

both males and females would be meaningful. In addition, previous studies indicated that adolescent EDT was associated with stressors arising from trouble in the parent-adolescent relationship (Minuchin et al., 2007) or inside or outside of the family (Kobayashi & Kurita, 2005). Kozuka (2011) examined each dyadic relationship (marital, father-adolescent, and mother-adolescent) in detail in non-clinical sample. Results indicated that family relationships generating little stress for adolescents were, based on close cohesion in each dyad, equal, i.e. each member had a similar amount of influence. Previous studies found an association between family relationships and EDT (Abrantes *et al.*, 2006; McGuire *et al.*, 2002; Byely *et al.*, 2000; Mellin *et al.*, 2002) and that adolescents perceive stressors inside or outside of the family (Minuchin et al., 2007; Kobayashi & Kurita, 2005). Those findings were synthesized with the findings from Kozuka (2011), who found an association between family relationships and stressors as perceived by adolescents, to formulate a hypothesis.

The current study had 2 aims. The first was to investigate the current status of EDT in Japanese adolescents. The second was to test the hypothesis that there are fewer adolescent EDT in a family with a highly cohesive structure and a balance of power and greater adolescent EDT in a family with a less cohesive structure and a power imbalance.

Methods

1. Participants and survey period

Seven hundred and fifty-five adolescents at 2 high schools in the Tohoku region and 4 universities in the Kanto, Tohoku, and Kansai regions were surveyed. Questionnaires were distributed 1) to high school students via their classes or homeroom or 2) to university students during class. Participation in this study was voluntary. A total of 663 data sets, excluding those with missing data and data from single-parent families, were analyzed.

The sample consisted of 333 high school students (197 males, 136 females) and 330 university students (144 males, 186 females). The mean age of the high school student sample was 16.62 years, $SD = .73$ (males: $M = 16.66$, $SD = .67$; females: $M = 16.5$ years, $SD = .80$). The mean age of the university student sample was 20.03 years, $SD = 1.57$ (males: $M = 20.15$ years, $SD = 1.83$; females: $M = 19.93$ years, $SD = 1.33$). The mean age of all participants was 18.32 years, $SD = 2.09$ (males; $M = 18.13$ years, $SD = 2.16$; females; $M = 18.51$ years, $SD = 2.09$).

2. Measures

1) Demographic characteristics

Participants were asked to fill in their age, sex, and living arrangements (living with one's family, living alone, or some other arrangement).

2) Family structure

The Inventory for Character of Intra-Inter Generation in Kinship (ICHIGEKI; Noguchi, Kozuka, Usami, & Wakashima, 2009) was used to assess the routine family structure as perceived by adolescents. The ICHIGEKI was

developed to conduct higher-level systems research on families. It can efficiently and comprehensively assess each dyadic relationship in a family and depict each dyad (marital, father-adolescent, and mother-adolescent) as a single item with little burden for participants. The ICHIGEKI has demonstrated adequate validity (Noguchi et al., 2009). The ICHIGEKI has a four-factor structure that includes cohesion, interests, power, and openness. The current study used two of those factors, cohesion and power, because these were considered to be main aspects in assessing family structure. Noguchi et al. (2009) reported that a single item on the ICHIGEKI was closely correlated with cohesion and power as measured with multiple items (cohesion: $r = .70$; power: $r = .52$) and that a single item had a certain level of validity. Noguchi et al. noted an inverse correlation between interests and cohesion ($r = -.54$) and viewed interests as a concept in contrast to cohesion. Therefore, interests were excluded from the current study because of the burden on participants and the complexity of ascertaining each dyad. Openness indicates the relationships that family members have with people outside the family and was similarly omitted.

Cohesion, a sub-scale of the ICHIGEKI, indicates togetherness, intimacy, and a sense of solidarity in each dyad. Cohesion was measured on a six-point scale ranging from "completely disagree" to "completely agree." Higher cohesion scores indicated a higher level of cohesion in each dyad. Power, a sub-scale of the ICHIGEKI, indicated the degree of

influence, one's ability to speak, and one's ability to make decisions and was estimated on a six-point scale ranging from "completely disagree" to "completely agree." Power was assessed in both directions in each dyad (six directions in total) to clarify who had power over whom. Participants were asked to recall routine situations ("what you feel are routine/ordinary family relationships") and to respond with a number. The higher the score for power, the stronger the relative power in each dyad.

3) EDT

In the current study, EDT were defined as eating problems that nonetheless did not meet diagnostic criteria for an eating disorder. Adolescent EDT were estimated using the Japanese version (Mukai, 2001) of the 26-item Eating Attitudes Test (EAT-26) developed by Garner et al., 1982. The EAT-26 has been used as a screening tool to differentiate healthy individuals, individuals with a clinically significant eating disorder, and at-risk individuals. The EAT-26 has been used to assess severity in individuals with a clinically significant eating disorder and to measure EDT in a sample consisting mostly of healthy individuals (Mukai, Cargo & Shisslak, 1994). The validity of this scale has been examined in Japan (e.g. Mukai et al., 1994), and it has been used to assess eating disorders and as an indicator of eating problems in studies involving non-clinical samples (e.g. Mukai, 2010).

The EAT-26 consists of 26 statements such as "I am terrified about being overweight," "I

avoid eating when I am hungry," and "I find myself preoccupied with food," and responses are given on a six-point scale ranging from "always" to "never." A response of 1, 2, or 3 is given a score of 0, 4 is scored as 1, 5 is scored as 2, and 6 is scored as 3. The cut-off score for all 26 items is 20 points. Nakai (2003) examined the validity of the EAT-26 in a Japanese sample and suggested that a score of 15 points was an appropriate cut-off score in Japan. Therefore, a score of 15 points on the EAT-26 served as the cut-off score in the current study.

Results

1. Descriptive statistics

Descriptive statistics for cohesion and power assessed with the ICHIGEKI were examined in each dyad (marital, father-adolescent, and mother-adolescent).

The EAT-26 was scored using the scoring method described earlier. The 25th item, "I enjoy trying new rich foods", was reverse-coded (Garner & Garfinkel, 1997). Cronbach's alpha coefficient is a measure of reliability and was $\alpha = .73$ for all 26 items, so adequate reliability was confirmed. Table 1 shows the descriptive statistics for cohesion and power in each dyad (marital, father-adolescent, and mother-adolescent) and EAT-26 scores.

2. Adolescent EDT

Table 1. *Descriptive Statistics for ICHIGEKI and EAT-26 (N = 663)*

		high school students				university students			
		males (N=197)		females (N=136)		males (N=144)		females (N=186)	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
ICHIGEKI									
cohesion	between father and adolescent	3.81	1.32	3.71	1.53	3.72	1.24	3.65	1.41
	between mother and adolescent	4.19	1.12	4.68	1.25	4.37	1.08	4.87	1.13
	between father and mother	3.92	1.33	3.99	1.44	3.94	1.41	3.97	1.39
power	adolescent vs. father	2.91	1.30	3.35	1.35	3.09	1.13	3.20	1.28
	adolescent vs. mother	3.23	1.25	3.29	1.23	3.49	1.18	3.58	1.20
	father vs. adolescent	3.74	1.42	3.38	1.41	3.64	1.24	3.49	1.31
	father vs. mother	3.44	1.39	3.39	1.33	3.51	1.45	3.66	1.36
	mother vs. adolescent	3.89	1.19	4.10	1.12	3.73	1.22	3.99	1.17
	mother vs. father	3.61	1.39	3.57	1.35	3.65	1.21	3.62	1.25
EAT-26		6.81	4.80	10.06	7.38	6.40	4.26	9.14	6.96

Based on the findings of Nakai (2003) as were mentioned earlier, the cut-off score on the EAT-26 was 15 points in the current study. Participants with a score higher than 15 points were categorized as having higher EDT (higher scores on the EAT-26) and those who scored below 15 points were categorized as lower EDT (lower scores on the EAT-26). Table 2 shows the grouping of high school students, university students, and the total sample.

In the high school student sample, 10 out of 197 males (5.80%) and 28 out of 136 females (20.59%), or 38 out of 333 participants (11.41%), were categorized as having higher EDT (higher scores on the EAT-26). In the university student sample, 9 out of 144 males

(6.25%) and 25 out of 186 females (13.44%), or 34 out of 330 participants (10.30%), were categorized as having higher EDT (higher scores on the EAT-26). In the total sample, 19 out of 341 males (5.57%) and 53 out of 322 females (16.46%), or 72 out of 663 participants (10.86%), were categorized as having higher EDT (higher scores on the EAT-26). The male-to-female ratio overall was 1 to 2.8. The sex ratio in the high school student sample and in the university student sample was similar to that in the total sample.

3. Association between family structure and adolescent EDT

Table 2. Groupings based on Eat-26 Scores

		<i>N</i>	%	EAT-26			
				high		low	
				15 points or more		14 points or less	
		<i>N</i>	%	<i>N</i>	%		
high school students							
	males	197	100.00	10	5.80	187	94.92
	females	136	100.00	28	20.59	108	79.41
	total	333	100.00	38	11.41	295	88.59
The ratio of male to female participants with higher EAT-26 scores (higher EDT)						1 : 2.8	
university students							
	males	144	100.00	9	6.25	135	93.75
	females	186	100.00	25	13.44	161	86.56
	total	330	100.00	34	10.30	296	89.70
The ratio of male to female participants with higher EAT-26 scores (higher EDT)						1 : 2.8	
whole							
	males	341	100.00	19	5.57	322	94.43
	females	322	100.00	53	16.46	269	83.54
	total	663	100.00	72	10.86	591	89.14
The ratio of male to female participants with higher EAT-26 scores (higher EDT)						1 : 2.8	

Family structures were classified in order to examine the association between family structure and adolescent EDT. There were marked sex differences in EDT according to the EAT-26, so only female data were used. The percentage of males with higher EDT (higher scores on the EAT-26) was less than 10% among both high school and university students. Given the frequency with which female adolescents routinely interact with their families, those relationships were assumed to play more of a role for female adolescents living with their families than those living apart. Therefore, 88 females who living alone or apart

from their family were excluded, and data on 234 females (mean age: 18.24 years, $SD = 2.13$) were analyzed. A Q-mode cluster analysis of the two sub-scale scores on the ICHIGEKI was performed for the marital, father-adolescent, and mother-adolescent dyads¹. The number of clusters were varied

¹ The score for power, a sub-scale of the ICHIGEKI developed by Kozuka (2011), in the marital dyad was obtained by subtracting the score for the mother vs. the father from the score for the father vs. the mother. Similarly, the score for power in the father-adolescent dyad (and mother-adolescent dyad) was obtained by subtracting the score for the adolescent vs. the father (mother) from the father (mother) vs. the adolescent. A higher score in the marital dyad indicated a more powerful father. A higher score for power in the

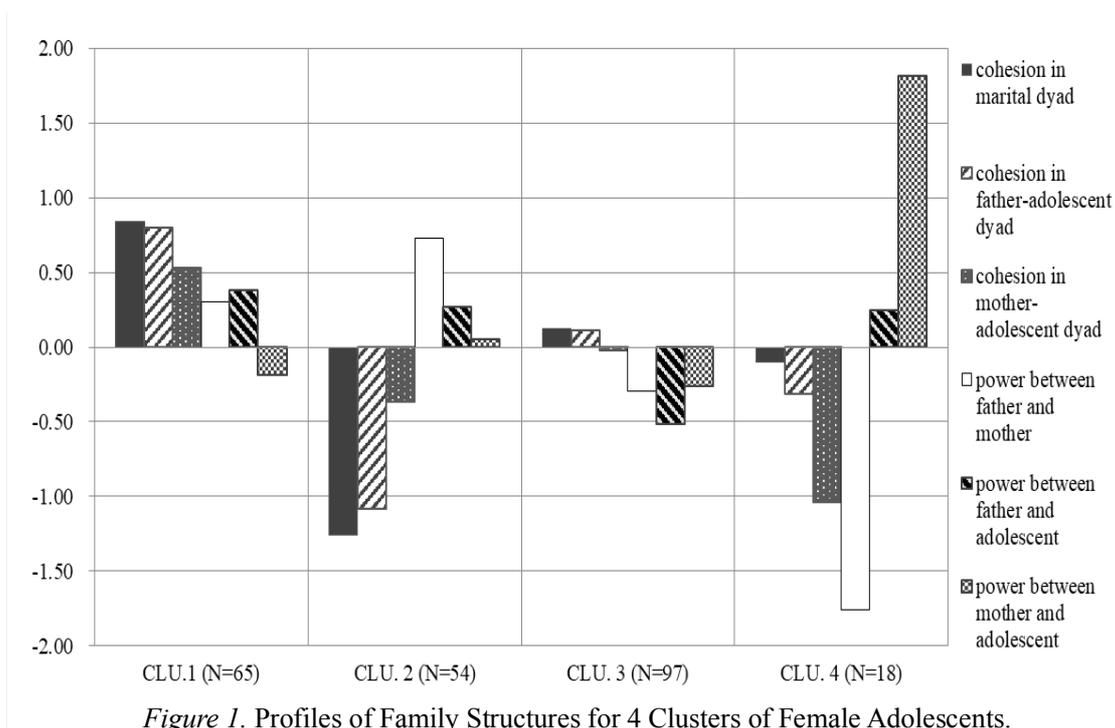


Figure 1. Profiles of Family Structures for 4 Clusters of Female Adolescents.

Note. CLU. 1 = a highly cohesive structure with a balance of power; CLU. 2 = a less cohesive structure with a powerful father; CLU. 3 = a structure with average cohesion and a balance of power; CLU. 4 = a structure with less mother-adolescent cohesion and a powerful mother.

from 2 to 5, and 4 distinct clusters were identified. The number of participants in each cluster and the interpretability of each cluster were examined. The results of cluster analysis are shown in Figure 1.

CLU. 1 consisted of 65 participants (28%) from the sample and was designated “a highly cohesive structure with a balance of power” because cohesion in each dyad was more than $.50SD$ and power in each dyad was between $-.50SD$ and $+.50SD$, so it was almost balanced in each dyad. CLU. 2 consisted of 54 participants (28%) from the sample. In CLU. 2, cohesion in the marital and father-adolescent dyads was less than $-1.00SD$, and

father-adolescent dyad (or mother-adolescent dyad) indicated a powerful father (or mother).

mother-adolescent cohesion was negative. The father’s power in the marital dyad was more than $+.50SD$, and the father’s power in father-adolescent dyad was positive. Therefore, CLU. 2 was designated “a less cohesive structure with a powerful father.” CLU. 3 consisted of 97 participants (41%) from the sample, and cohesion was average in all of the dyad. Adolescents had slightly more power in the father-adolescent dyad, but power was almost balanced in each dyad in comparison to the other clusters. Thus, CLU. 3 was designated “a structure with average cohesion and a balance of power.” CLU. 4 was a small group of 18 participants (8%) from the sample, and it was designated “a structure with less mother-adolescent cohesion and a powerful

Table 3. χ^2 Test of EAT-26 Scores by Family Structure Cluster.

			CLU.1	CLU.2	CLU.3	CLU.4	χ^2	
EAT-26	high	frequency	41	5	17	14	5	
		expected frequency	11.39	9.46	17.00	3.15		
		adjusted residual	-2.45	3.08	-1.05	1.19		
low	frequency	193	60	37	83	13	13.58(3)*	
		expected frequency	53.61	44.54	80.00	14.85		
		adjusted residual	2.45	-3.08	1.05	-1.19		
total	frequency	234	65	54	97	18		

* $p < .05$

Note. CLU. 1 = a highly cohesive structure with a balance of power; CLU. 2 = a less cohesive structure with a powerful father; CLU. 3 = a structure with average cohesion and a balance of power; CLU. 4 = a structure with less mother-adolescent cohesion and a powerful mother.

mother.” In CLU. 4, mother-adolescent cohesion was less than $-1.00SD$. The father’s power in the father-adolescent dyad was less than $-1.50SD$, and the mother’s power in the mother-adolescent dyad was more than $+1.50SD$. Roughly speaking, CLU. 1 has a highly cohesive structure with a balance of power, while the other clusters had a structure with a power imbalance and average or less cohesion. Although CLU. 3 is similar to CLU. 1, cohesion in each dyad was not particularly strong in CLU. 3.

A chi-square test was performed with the 4 family structure clusters as independent variables and a higher score or lower score on the EAT-26 as a dependent variable (Table 3). Results revealed significant differences at the

5% level in terms of the ratio of the number of participants with higher EDT (higher scores on the EAT-26) and participants with lower EDT (lower scores on the EAT-26) between clusters ($\chi^2(3) = 13.58, p = .05$). Residual analysis revealed that the proportion of participants with higher EDT (higher scores on the EAT-26) was significantly lower at the 5% level and that the proportion of participants with lower EDT (lower scores on the EAT-26) was significantly higher at the 5% level in CLU. 1, which had a highly cohesive structure with a balance of power. In contrast, the proportion of participants with higher EDT (higher scores on the EAT-26) was significantly higher at the 1% level in CLU. 2, which had a less cohesive structure with a powerful father. In the other

clusters, there were no associations between family structure and EDT.

Discussion

This study had 2 aims. The first was to reveal the state of EDT in Japanese adolescents. The second was to examine the association between family structure and EDT. The following hypothesis was tested: fewer adolescent EDT in a highly cohesive family with a balance of power and greater adolescent EDT in a less cohesive family with a power imbalance.

1. Adolescent EDT

In this study, 53 out of 322 female adolescents (16.46%) were classified as having higher EDT (higher scores on the EAT-26) based on a total score of 15 points or higher on the EAT-26. Nakai (2003) used a cut-off score of 15 points on the EAT-26 and found that 14.8% of 961 females ages 15 to 35 years had a score above 15 points. Even though the current results are about 2% higher than those of Nakai (2003), the current findings seem to be almost the same as those of Nakai (2003) given the difference in sample sizes. Thus, these results suggest that a certain percentage of adolescents have eating problems.

However, a look at the current sample in detail indicates that 20.59% of 136 female school students and 13.44% of 186 female university students had higher EDT (higher scores on the EAT-26). The percentage of high school students, that is, young people, is seemingly higher even when the sample size or sample population is taken into account. In

contrast, 5.57% of male adolescents (19 out of 341 males) had higher EDT (higher scores on the EAT-26). Although a simple comparison of these data is not possible because few studies have examined male EDT, a number of male high school or university students have EDT. , The male-to-female ratio was all 1 to 2.8 for high school students, university students, and the total sample. Epidemiological studies of eating disorders in males have reported a prevalence of one-twentieth to one-tenth that in females (American Psychiatric Association, 2013). When adolescent eating problems are viewed as a pathology, there is an extremely marked sex difference in prevalence. When those problems are viewed as EDT, however, their prevalence in males is about one-third that in females. This suggests that eating problems definitely exist in males as well as in females. Hence, a certain percentage of male and female adolescents have some form of eating problem, regardless of whether they are seen at a medical facility or whether or not they are diagnosed with an eating disorder. Eating problems need to be investigated in non-clinical samples including males and females.

2. Family structure and adolescent EDT

Family structure was classified using cluster analysis and differences in EDT by type of family structure were examined in order to reveal the association between family structure and adolescent EDT. In CLU. 1, which had a high cohesive structure with a balance of power, the ratio of participants with higher EDT (higher scores on the EAT-26) was lower and

the ratio of participants with lower EDT (lower scores on the EAT-26) was higher than in the other clusters. In CLU. 2, which had a less cohesive structure with a powerful father, the ratio of participants with higher EDT (higher scores on the EAT-26) was higher and the ratio of participants with lower EDT (lower scores on the EAT-26) was lower than in the other clusters. CLU. 1 is a family structure with a balance of power among the adolescent, mother, and father based on a higher level of cohesion in all 3 dyads. In contrast, CLU. 2 is a family structure with a powerful father based on a low level of cohesion. Therefore, families of female adolescents with fewer EDT are intimately connected. In addition, a high level of cohesion, particularly in the marital and father-adolescent dyads, and an equal relationship, i.e. each member has the same level of influence, suppress adolescent eating problems. These results generally support the hypothesis put forward. Hence, the current results imply that a highly cohesive family structure with a balance of power indicate perceived stressors as well as adolescent maladaptation in the form of EDT (Kozuka, 2011). Moreover, the current findings indicate that family cohesion helps to suppress eating problems in the general population like high school or university students and to suppress unhealthy eating by obese adolescents as reported by Mellin et al. (2002). Consequently, the current findings suggest that the nature of family relationships is associated with an adolescent's problems during adolescence. The current results also suggest that adolescents need to be able to influence

their parents, instead of parents being able to unilaterally influence adolescents, based on a highly cohesive marital dyadic relationship as well as a highly cohesive parent-adolescent dyadic relationship.

There were significant differences in the ratio of adolescent EDT among the 4 types of family structures identified in this study. An association between family structure and EDT was suggested, but all of the family structures had adolescents with higher EDT (higher scores on the EAT-26). This implies that the nature of a family's structure or the nature of each dyadic relationship does not necessarily cause adolescent eating problems. Negative family structures (e.g. less cohesion with a power imbalance) can also presumably arise because an adolescent has eating problems. Eating problems are likely to put an adolescent's life at risk, suggesting more marked family interactions. There is less cohesion in each dyad and parents are forced to wield power. The current study was unable to determine whether there is a cause-and-effect between family structure and EDT. At the current point in time, however, one can reasonably view adolescent eating problems as varying with family structure and one can view interaction between adolescents and family members as the issue. Regardless, the current results suggest that family relationships are significant environmental factors associated with adolescent eating problems and that certain family relationships are likely to suppress those problems.

3. *Clinical implications*

During a session with family members of an adolescent with EDT, some clinicians and researchers have pointed out therapists should intervene by clarifying the boundary between sub-systems (e.g., Minuchin et al., 1978). They suggested that a clear boundary enables adolescents to express their thoughts and feelings and interact with their parents and that it creates a hierarchical structure that parents can lead. However, the current results suggest that therapists should increase cohesion in each dyad and work on the power relationship between parents and the adolescent rather than intervening in the boundary between dyadic sub-systems. When an adolescent exhibits unhealthy eating, parental action to stop it might weaken cohesion in each dyad and create a family structure with a power imbalance. When family cohesion is maintained and an adolescent has less power, therapists need to intervene in the family structure to allow the adolescent to make decisions and influence fellow family members, i.e. having family members respect the autonomy and decision-making ability of the adolescent. Problems faced by adolescents have become more complex over the past few years. Given its applicability in clinical settings, examining the association between family structure and adolescent EDT is essential to resolving those problems and helping adolescents.

4. *Topics for the future*

This study examined the association between adolescent EDT and family structure in only a

female sample because of limitations on the sample size. Therefore, future studies should examine the current findings in light of sex differences. In addition, future studies should take account of information such as height, weight, and menstruation in order to examine the potential for adolescent eating problems to create negative family structures. The current study used a non-clinical sample to identify eating problems in the general population. Future studies should also consider whether EDT are an extension of eating disorders and then examine differences between clinical samples and non-clinical samples in detail.

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The relationship between fear of COVID-19 and coping behaviors in Japanese university students

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ABSTRACT. COVID-19 is spreading all over the world, causing various social problems. The purpose of this study was to investigate the effects of fear of COVID-19 on the coping behavior of university students. 300 Japanese university students responded to the questionnaire. The results indicated that those who had a high fear of COVID-19 and emphasized tuning into others were more likely to adopt the coping behaviors of avoidance of contact and stockpiling, while those who emphasized self-determination were more likely to adopt the coping behaviors of avoidance of contact and focus on health care.

KEY WORDS: Fear of COVID-19, University students, Coping behavior

Introduction

In December 2019, a novel coronavirus (COVID-19) was discovered in the city of Wuhan in Hubei Province of China (World Health Organization, 2020b). As of June 23, 2020, COVID-19 continued to spread on a global scale, infecting more than 8,860,331 people in 216 countries and killing 465,740 individuals (World Health Organization, 2020a). On January 16, 2020, the first case of COVID-19 infection with a history of stay in Wuhan was confirmed in Japan (Minister of Health, Labour and Welfare, 2020a).

Subsequently, the number of infected people among Japanese who had not travelled to Wuhan City increased, and the infection spread throughout the country, mainly in Tokyo and Osaka. On April 16, 2020, the Japanese government declared a national state of 42 emergencies. The declaration of the state of emergency led to major changes, such as refraining from going out of the house unnecessarily, shifting to work at home, and closing schools. These social changes have made people anxious, and in Japan, people are buying a lot of face masks and sanitizers (stockpiling) (Asahi Shimbun Digital, 2020a). Due to some people stockpiling more than necessary to prevent infection, there were many people who could not get the products even though the supply should have been sufficient. In the absence of accurate information about the supply of products and effective preventive

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measures, it can be said that it is a natural reaction to become fearful and over-prepared. In fact, Yıldırım et al. (2021) showed that vulnerability, risk perception, and fear of infection increase preventive behaviors. However, this phenomenon is an issue that needs to be resolved in order to fight infectious diseases more effectively.

From the point of view of Yıldırım et al. (2021), fear is expected to have a positive aspect in terms of increasing preventive behaviors, but it cannot be denied that under certain conditions, it may increase inappropriate behaviors based on misinformation. Therefore, it is necessary to examine what factors cause inappropriate behaviors such as excessive stockpiling. In this study, we examined whether fear-induced behaviors lead to recommended coping behaviors such as hand washing and avoiding crowds, or inappropriate coping behaviors such as excessive stockpiling, focusing on the reasons for the coping behaviors. While it is difficult to change fear and risk perception, which have been pointed out to be related to preventive behaviors, the reasons for these behaviors are factors that can be easily changed by providing correct information and improving literacy. By showing that reasons mediate the effects of fear on coping behavior, it is possible to reduce the inappropriate coping behavior of over-stocking by intervening with a focus on the reasons for the behavior, even if fear is high.

Ahorsu (2020) developed the Fear of COVID-19 Scale (FCV-19S) to measure the fear of COVID-19. The reliability of this scale was confirmed in terms of internal consistency and

re-testing methods. In addition, the validity of the scale was confirmed by positive correlations with depression anxiety and awareness of vulnerability to infection. Therefore, the FCV-19S is a valid tool for assessing fear of COVID-19. And Wakashima et al. (2020) developed a Japanese version of FCV-19S and confirmed its validity and reliability. Therefore, in the present study, we used this scale to examine the effect of fear of COVID-19 on coping behavior, focusing on the reasons for the behavior.

In this study, university students were surveyed. The reason for this is that it has been pointed out that a certain number of university students are negatively affected psychologically by the Corona disaster. For example, Cao et al. (2020) indicate that about 24.9% of college students have experienced anxiety because of the COVID-19 outbreak. In addition, Shun et al. (2021) reported that 67.05% of Chinese university students exhibited traumatic stress, 46.73% depressive symptoms, 34.73% anxiety symptoms, and 19.56% suicidal thoughts while being forcibly isolated from interpersonal contact. From the above, university students are negatively affected by the coronary disaster, and it is important to understand the actual situation regarding the psychological responses shown by Japanese university students.

On the other hand, not all university students are negatively affected by the coronary disaster, and some students may be unaffected under certain conditions. Cao et al. (2020) showed that living in an urban area, living with parents, and having a stable household income inhibited the likelihood of university students experiencing

anxiety during a COVID-19 outbreak. In contrast, having relatives or acquaintances who were infected with COVID-19 was shown to increase the likelihood of experiencing anxiety. It was also shown to be associated with financial stress, social prejudice, and serious symptoms of threat to COVID-19, especially by COVID-19 (Shun et al., 2021). Furthermore, Yıldırım et al. (2021) pointed out the influence of gender on fear, indicating that women are more vulnerable to infection, higher perceived risk, higher fear, and more preventive behaviors than men. Until now, there has been no study that has investigated the actual state of fear of COVID-19 in Japanese university students. In the present study, we examined the effects of fear of COVID-19 on coping behaviors, focusing on the reasons for the behaviors, among Japanese university students. We also examined the conditions that inhibit or enhance fear.

Methods

Procedure

The study used an internet-based survey based on Survey Monkey. Informed consent was provided through an online text. The first section of the survey stated the purpose of the survey, that participation was voluntary, and that the survey was anonymous and personal information would not be disclosed to third parties. After confirming everything about the survey description, they were asked if they agreed to cooperate with the survey. Only those who agreed to cooperate in the survey would be able to proceed to the questionnaire. On the other hand, those who did not agree were

terminated from the survey. Those who withdrew from responding to the survey were also excluded from the survey.

The participants included six whose nationality was not Japanese and one whose age was over 50 years old. Seven individuals were excluded from the analysis in this study because differences in nationality and a large age gap were thought to reduce the homogeneity of the sample. The respondents of the analysis (52 men and 248 women) were in their 18 to 20s with an average age of 19.80 years ($SD = 1.36$) and were Japanese undergraduate and graduate students living in Japan. All had agreed to cooperate with the survey. The survey questionnaire was administered in May 10 and June 14, 2020.

Ethical Consideration

The first section of the survey stated the purpose of the survey, that participation was voluntary, and that the survey was anonymous and personal information would not be disclosed to third parties. Additionally, the Tohoku University Graduate School of Education's ethics committee granted ethical approval for this study (ID: 20-1-003).

Survey Description

Attributes of the respondents: The survey questionnaire asked the sex, age, nationality, and residential area (city and prefecture) of each respondent as a free answer. This item was followed by a multiple-choice question asking about the respondents' health condition at the time, which allowed for responses of 1 = "in normal condition," 2 = "having a fever of 37.5°C or higher," 3 = "having a sore throat," 4 = "having a deep fatigue," 5 = "having a cough,"

and 6 = "having other symptoms" (Minister of Health, Labour and Welfare, 2020b). The subsequent analysis combined answers that included at least one from choices 3 through 6 into one group and made three groups, including 1 = "in normal condition," 2 = "having a fever of 37.5° or higher," and 3 = "having other symptoms." The next question categorized the diseases being treated at the time into respiratory diseases, mental disorders (anxiety disorder, depression, and other mental disorders), and other diseases. Respondents who reported having a disease were asked to provide the name of the disease using an open-ended questionnaire, and based on this information, they were classified into three categories: 1=respiratory, 2=mental, and 3=other. Those who reported an illness but did not respond appropriately to the disease under treatment, such as "none" in the open-ended answer, were coded as 0. Subsequent questions asked all respondents whether they smoked. All respondents to this survey were Japanese university students. The analysis used sex, age, health condition, disease status, and smoke status at the time as their attributes.

The state of university and life style: Participants responded to the following questions about their university and lifestyle. They were asked about the timing of the start of university classes, the format of university classes, their readiness to take online classes, main means of transportation, their exercise habits, and their waking and sleeping times. Respondents responded to the three items "I have the necessary environment to study," "I am

financially deprived," and "I am satisfied with the support I am receiving from the university" on a scale of 1="not at all" to 5="very satisfied". The analysis used format of university classes, main means of transportation as their state of university and life style.

Family composition: Respondents were asked about the number of family members living with them, their relation to the respondents, their ages, whether they had respiratory or other diseases, their smoking history, and their pregnancy status (only female family members living with the respondents). In addition, the respondents were asked about changes in the amount of conversations and conflict of opinions in the family living together in the last month. The analysis used format of whether they live with family as their state of family.

Sources of information about COVID-19: Respondents were asked a multiple-choice question about media that they regarded as a valuable source of information about COVID-19. They were also asked to rank such information sources from the first to the third based on their importance. Specific sources of information indicated in the answers were 1= newspaper, 2 = news on TV, 3 = talk shows on television, 4 = websites of public organizations, 5 = news on the internet, 6 = Twitter, 7 = Facebook, 8 = Instagram, 9 = other social networking services ("SNS"), and 10 = other media. The analysis used only the most prioritized information sources and combined choices 6–9 into a single group called "SNS".

Presence of persons infected with COVID-19 around the respondents: Respondents were

asked whether anyone with whom they were acquainted had contracted COVID-19. Any respondent acquainted with an infected person was asked to describe their relationship. To assess the status of COVID-19 infection around the respondents, the survey asked whether an infected person was 1 = "in the same prefecture," 2 = "in the same municipality," or 3 = "in the same district" as the respondents or 4 = no one was infected around them. The analysis combined answers 1 through 3 into one group and labelled it 1 = "there is an infected person nearby," and those who answered 4 labelled as 0 = "there is no infected person nearby."

Measuring a fear of COVID-19: The study used a Japanese version of the Fear of COVID-19 Scale ("FCV-19S-J") developed by Wakashima et al. (2020) The Japanese version of the scale that was completed consisted of seven items in the same manner as the original. FCV-19S-J asks questions to be answered on a scale of 1 = "I am not afraid of COVID-19 at all" to 5 = "I am most afraid of COVID-19." A higher score reflects a greater a fear of COVID-19.

Coping behavior against COVID-19: Respondents were asked about their coping behavior against COVID-19. Wakashima et al. (2020) produced 19 items to measure the coping behavior against COVID-19 based on the report of the Ministry of Health, Labour and Welfare (2020c) and article on social issues (Asahi Shimbun Digital, 2020b). In this study, we used the 19 items developed by Wakashima et al. (2020) as a scale of coping behavior against COVID-19. Each of these 19 items was rated on a six-point scale ranging from 1 (not at all) to 6

(very much). The coping behaviors against COVID-19 measured by these items include behaviors to prevent oneself from being infected and to prevent others from being infected, as well as behaviors necessary for daily life in the event of coronary disasters.

Reason for behavior: Respondents were asked about reason for coping behavior against COVID-19. Wakashima et al. (2020) produced 7 items to measure the reason for the coping behavior against COVID-19 based on two perspectives which one is proactive reasons (e.g., "I did it because I felt it was necessary for myself") and another one is passive reasons (e.g., "I did it because other people told me to"). Each of these 7 items was rated on a six-point scale ranging from 1 (not applicable at all) to 6 (highly applicable). These items asked respondents to give reasons for their coping behavior toward COVID-19 in general. Therefore, the respondents did not answer the reasons for each coping behavior, but answered the seven items that asked for reasons once.

Data analysis

Statistical operations were conducted using software (SPSS 23.0 and JASP 0.12.2). For confirmatory factor analysis (CFA), a robust maximum likelihood estimator (MLR) was applied in this study. To test goodness of fit, we conducted the following analyses: comparative fit index (CFI), root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR) and Bayesian information criterion (BIC). The cut-off values for acceptable model fit used for this study were: RMSEA < .10 for acceptable fit and < .06 for

good fit; CFI > .90 for acceptable fit and >.95 for good fit; and SRMR < .10 for acceptable fit and < .08 for good fit (Hu and Bentler, 1999; Kline, 2011). In exploratory factor analyses (EFA), MLR and goemin rotation was applied for coping behavior and reason for behavior. We removed items with factor loadings lower than .35. Cronbach's alpha coefficients, McDonald's omega coefficients, and correlations between the FCV-19S-J and other measures were established by calculating Pearson's correlation coefficients. Reported effect sizes are interpreted using Cohen's d and η^2 , including 95% confidence intervals, respectively. All statistical analyses used two-tailed tests. For all statistical evaluations, p values less than .05 were considered indicative of significant differences. The missing values were visible only in age. Therefore, pairwise deletion was used for missing data.

Results

Reliability and validity of Japanese FCV-19S-J for university student

Confirmatory factor analyses, as described by Ahorsu et al. (2020), were used to examine the goodness of fit. Results showed that the FCV-19S-J did not fit well (Table 1).

To improve the model fit, modification indices (MIs) were used. The MI between items 1 and 4 (MI = 43.30), between items 3 and 6 (MI = 28.46) were higher values and between items 2 and 5 (MI = 16.55) were higher values. Therefore, a within factor error-covariance between items 1 and 4, between items 3 and 6, between items 2 and 5 (Model 2) was included.

Results indicated that the modified model (Model 2) was more acceptable (CFI = .960, RMSEA = .098, SRMR = .053). This was the final model. The reliability coefficients were also high ($\alpha=.84$) and indicated sufficient internal consistency.

Participants' basic characteristics

Table 2 shows participants' basic characteristics. The present study had 300 participants, mostly women (82%). The results of the t-test and one-way analysis of variance

showed that women scored higher on the FCV-19S-J than men. This indicates that women have a stronger fear of COVID-19. As for corona-related symptoms, no one has a fever of 37.5°C or higher, and those who reported having other symptoms also had a low percentage (4.3%). 95.7% of people are as usual, and the impact of COVID-19 on physical condition among university students is limited. No significant differences were obtained for fear of COVID-19 due to symptoms. Regarding the disease under treatment, 92.3% of the respondents answered "None", 2.3% for "Respiratory", 1.7% for "Mental", and 3.7% for "Other". There was significant difference in fear of COVID-19 by disease under treatment. However, the results of multiple comparisons showed no significant differences between the disease groups. With regard to smoking status, 4.3% of the respondents were smokers and 95.7% were non-smokers. There was no significant difference in fear of COVID-19 by status of smoke. As of late May, 15.3% of the students were taking face-to-face classes. This indicates that many students were participating

Table 1. Factor Loadings for the FCV-19S-J

Items	Factor loadings		
	Model 1	Model 2	
FCV-19S-J($\alpha=.84 / \omega=.86$)			
1 I am most afraid of coronavirus-19.	.545	.504	
2 It makes me uncomfortable to think about coronavirus-19.	.815	.781	
3 My hands become clammy when I think about coronavirus-19.	.543	.545	
4 I am afraid of losing my life because of coronavirus-19.	.539	.493	
5 When watching news and stories about coronavirus-19 on social media, I become nervous or anxious.	.778	.713	
6 I cannot sleep because I'm worrying about getting coronavirus-19.	.507	.507	
7 My heart races or palpitates when I think about getting coronavirus-19.	.780	.813	
	χ^2	120.121***	42.854***
	df	14	11
	CFI	0.868	0.960
	RMSEA	0.159	0.098
	90% CI	0.133-0.186	0.068-0.130
	SRMR	0.078	0.053
	BIC	5186.178	5126.022

Note: CFI, comparative fit; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; and BIC, Bayesian information criterion; *** $p < .001$

in the classes online. There was no significant difference in fear of COVID-19 by class format. There were also no significant differences in the main means of transportation. Regarding the type of residence, 33.3% of the participants lived with their family and 66.9% did not live with their family. There was no significant difference in fear of COVID-19 according to the type of

residence. The most important sources of information are news on TV at 44.3%, websites of public organizations at 25.3%, and social networking sites at 10%. There was no significant difference in fear of COVID-19 by the most important sources of information. Only 1% of the respondents knew someone who had been infected with the COVID-19, and most of

	<i>N</i> =300	%	FCV-19-J		Statistics	Effect Size
			<i>Mean</i>	<i>SD</i>		
Gender						
1= Men	52	17.3%	2.63	0.70	$t(298)=4.39^{***}$	$d=0.67$
0= Women	248	82.7%	2.17	0.64		
Symptom						
0= Normal condition	287	95.7%	2.57	0.71	$t(298)=1.69$ n.s.	$d=0.48$
1= Having fever	0	0%	-	-		
2= Having other symptom	13	4.3%	2.23	0.63		
Disease						
0= Nothing	276	92.0%	2.58	0.71	$F(3, 296)=2.70^*$	$\eta^2=0.03$
1= Respiratory	7	2.3%	2.12	0.74		
2= Mental	5	1.7%	2.69	0.59		
3= Others	12	4.0%	2.12	0.53		
Smoke						
1= Yes	13	4.3%	2.53	0.63	$t(289)=1.57$ n.s.	$d=0.45$
0= No	287	95.7%	2.57	0.71		
Class Format						
1= Including face to face	46	15.3%	2.70	0.72	$t(298)=-1.53$ n.s.	$d=-0.24$
0= Not including face to	254	84.7%	2.53	0.63		
Main Means of Transport						
1= Public transport	113	38.2%	2.54	0.67	$t(298)=-1.53$ n.s.	
0= Other means	183	61.8%	2.54	0.75		
Type of Residence						
1= Living with family	200	33.3%	2.54	0.75	$t(298)=0.27$ n.s.	$d=0.03$
0= Not living with family	100	66.7%	2.56	0.67		
The most important source of information						
1= Newspaper	25	8.3%	2.82	0.78	$F(5, 294)=1.79$ n.s.	$\eta^2=0.03$
2= News on TV	133	44.3%	2.55	0.67		
3= Talk shows on	15	5.0%	2.65	0.87		
4= Websites of public	76	25.3%	2.56	0.68		
5= News on the internet	21	7.0%	2.21	0.75		
6= SNS	30	10.0%	2.53	0.71		
Infection of an acquaintance						
1= Yes	3	1.0%	2.43	1.00	$t(298)=.31$ n.s.	$d=0.18$
0= No	297	99.0%	2.56	0.71		

Note: "n.s." means "not significant," * $p < .05$, *** $p < .001$

them (99%) did not know anyone who had been infected with the COVID-19. There was no significant difference in fear of COVID-19 according to the existence of a corona-infected acquaintance.

Effects of coronal anxiety on coping behavior

A factor analysis was conducted of coping behaviors and the reasons for these behaviors. Results show that 14 items from three factors were extracted for coping behavior (Table 3); 6 items from two factors were extracted for reasons for the behavior (Table 4).

Three factors were identified for coping behavior: contact avoidance, consisting of items such as "Avoided places with large crowds"; focus on health care, consisting of items such as "Monitored health condition more carefully than before"; and stockpiling, consisting of items such as "Purchased food in larger quantities than usual". The factor structure of the coping behaviors showed an acceptable fit and the reliability of each factor was satisfactory. Two factors were identified for reason for behavior: Tuning into others, consisting of items such as "I followed other people"; and Self-determination, consisting of items such as "I did it because I felt it was necessary for myself". The factor structure of the coping behaviors showed a good model fit and the reliability of each factor was acceptable. The descriptive statistics of these scales are presented in Table 5.

To examine direct and indirect effects of fear of COVID-19 on coping behavior mediated by reason for these behaviors, the bootstrap method (bootstrap sample size 5000) conducted with PROCESS v2.16.1 created by Preacher et al.

(2007). The results are shown in Table 6. According to Murayama (2007), the indirect effect is considered significant when the 95% confidence interval obtained from the bootstrap method does not include zero. As a result, FCV-19S-J showed a direct effect on the avoidance of contact and an indirect effect mediated by tuning into others and self-determination. As a result, FCV-19S-J showed a direct effect on the avoidance of contact and an indirect effect mediated by tuning into others and self-determination. FCV-19S-J showed a direct effect on the focus on health care and an indirect effect mediated by self-determination. FCV-19S-J showed a direct effect on the stockpiling and an indirect effect mediated by confirming behavior.

Discussion

This study examined the reliability and validity of the Japanese version of the FCV-19S for university students in Japan in order to examine the effects of fear of COVID-19 on coping behavior, focusing on the reasons for the behavior. As in Ahorsu et al. (2020), the results of factor analysis indicated a single factor structure. The α coefficient and ω coefficient in FCV-19S-J returned sufficient values, which suggests adequate reliability and validity. In FCV-19S-J, the goodness of fit was made an acceptable value by assuming an error correlation between items 1 and 4, between items 3 and 6, between items 2 and 5.

The average FCV score of Japanese university students was 2.55. On the other hand, in a survey of Spanish university students by Martínez-

Table 3. Factor Loadings for the coping behavior

Items	Factor loadings		
	F1	F2	F3
F1 Avoidance of contact ($\alpha=.79$ / $\omega=.80$)			
2 Avoided places with large crowds.	.970	-.160	-.026
1 Avoided places with poor ventilation.	.729	-.005	.072
3 Avoided having a conversation or utterance in proximity to another person.	.666	.030	.054
16 Refrained from eating out.	.351	.246	.000
F2 Focus on health care ($\alpha=.71$ / $\omega=.75$)			
10 Monitored health condition more carefully than before.	.081	.629	.107
19 Voluntarily collected information.	-.087	.629	.107
4 My heart races or palpitates when I think about getting coronavirus-19.	.240	.547	-.124
5 Washed hands, gargled, or sanitized hands and fingers using alcohol.	.188	.485	-.058
14 Concentrated on what you needed to do such as work and study.	.026	.462	-.023
17 Sought connection with others through SNS or the Internet.	-.190	.450	.127
15 Did something you liked that you were able to do at home	.022	.444	-.088
9 Observed changes in your health condition by measuring body temperature, etc.	-.033	.404	.083
F3 Stockpiling ($\alpha=.91$ / $\omega=.91$)			
8 Purchased food in larger quantities than usual.	.028	-.007	.988
7 Purchased commodities in larger quantities than usual.	.032	.028	.815
	F1	-	
	F2	.621	-
	F3	.282	.313
			-
	χ^2	211.432***	
	df	74	
	CFI	0.901	
	RMSEA	0.079	
	90% CI	0.066-0.091	
	SRMR	0.062	
	BIC	12472.544	

Note: CFI, comparative fit; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; and BIC, Bayesian information criterion; *** $p < .001$

Table 4. Factor Loadings for the reason for behavior

Items	Factor loadings	
	F1	F2
F1 Tuning into others ($\alpha=.76$ / $\omega=.75$)		
4 I followed other people.	.816	-.084
5 I did it because other people told me to.	.741	-.014
6 I did it out of a fear of criticism that would be raised by other people.	.576	-.010
F2 Self-determination ($\alpha=.59$ / $\omega=.64$)		
1 I did it because I felt it was necessary for myself.	-.002	.771
3 I did it based on my own decision.	-.259	.604
7 Doing it made me feel secure.	.218	.416
	F1	-
	F2	-.065
	χ^2	37.753***
	df	8
	CFI	0.916
	RMSEA	0111
	90% CI	0.077-0.148
	SRMR	0.092
	BIC	5598.676

Note: CFI, comparative fit; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; and BIC, Bayesian information criterion;

*** $p < .001$

Table 5. Descriptive statistics of the scale

	<i>Mean</i>	<i>SD</i>	Min	Max
FCV-19-J	2.55	.71	1.00	4.57
Coping behavior				
Avoidance of contact	4.91	.94	1.00	6.00
Focus on health care	4.60	.71	1.00	6.00
Stockpiling	3.50	1.43	1.00	6.00
Reason for behavior				
Tuning into others	3.33	1.10	1.00	6.00
Self-determination	4.40	.86	1.00	6.00

Lorca, et al. (2020), the average FCV score was 2.40. In this survey, 82% of the respondents were female and 18% were male, which is roughly the same composition as the gender ratio in this study, so it can be said that Japanese university students tend to be slightly higher than their Spanish counterparts. In addition, a survey conducted in Spain and the Dominican Republic, covering a wide range of generation groups, found that the average FCV was 2.17. In this survey, 26.8% of the respondents were males and 73.2% were females, which is similar to the ratio of males and females in the present survey, so it can be said that Japanese university students tend to have a slightly higher FCV. On the other hand, in a survey by Wakashima et al. (2020), which covered a wide range of generations in Japan, the average score for FCV was 3.04. Since there were more males and females in this survey (65% and 35%, respectively), it is not possible to make a simple

comparison with this survey, but it is apparent that Japanese university students are less fearful than other generations. As we have seen above, the fear of university students in Japan tends to be low, but Japan as a whole tends to have a high level of fear compared to other countries. It should be noted that the above discussion is not a statistical study. It is necessary to compare the tendency of fear among Japanese university students using statistical methods, and this is an issue for the future.

In order to also examine the conditions that inhibit or enhance the fear of university students, the factors influencing the fear of COVID-19 was investigated by t-test and analysis of variance. The results showed that women had a higher fear of COVID-19. As already mentioned, Yıldırım et al. (2021) showed that vulnerability, risk perception, and fear of infection increase preventive behaviors. Also, depressive symptoms in adolescent and adult females are higher than in males (Oliver & Simmons, 1985), and females are known to be at higher risk for post-traumatic stress disorder than males (Weems et al., 2010). These findings suggest that women were more emotionally affected by stress situations than men, and therefore women demonstrated a more intense fear of COVID-19.

However, the fear scores did not indicate a significant difference based on other factors such as the symptom, disease, smoke, class format, main means of transport, source of information, whether they lived with their family, and whether they knew of an infected acquaintance. Cao et al. (2020) reported that having a family member or acquaintance

Table 6. The direct and indirect effects of FCV-19-J on coping behavior

Independent variable	Mediating variable	Dependent variable	Effect size	SE	95% CI	
	=====>		.198	.096	.010	.387
FCV-19S-J	=> Tuning into others =>	Avoidance of contact	.029	.021	.001	.089
	=> Self-determination =>		.111	.040	.043	.200
	=====>		.218	.051	.117	.319
FCV-19S-J	=> Tuning into others =>	Focus on health care	.014	.011	-.0002	.047
	=> Self-determination =>		.072	.026	.029	.135
	=====>		.362	.115	.136	.589
FCV-19S-J	=> Tuning into others =>	Stockpiling	.039	.025	.005	.112
	=> Self-determination =>		.032	.024	-.005	.097

infected with COVID-19 would raise people’s anxiety and that living with parents would help reduce their anxiety. They also showed that financial stress, social prejudice, and threats to COVID-19 were associated with serious psychiatric symptoms (Shun et al., 2021). The results of this study and those reported by Cao et al. (2020) and Shun et al. (2021) showed different results. The reasons for the different results include differences in the attributes of culture and social conditions. In particular, the COVID-19 infection situation in Japan was not as severe as in China, and restrictions on going out were not mandatory. It is possible that some people living alone may not have chosen to live with their families because of their low fear of COVID-19. On the other hand, people who wanted to live with their families but could not live with them due to various restrictions may

continue to have high levels of fear of COVID-19. While there were many students like the latter in China, there was a certain percentage of students like the former in Japan. In summary, although we cannot exclude the possibility that family members could be a factor in suppressing fear of COVID-19, there was no effect in Japan because a certain number of people did not choose to live with family members due to a low level of fear. It is also possible that the situation of infection in Japan was improving at the time this study was conducted, and therefore the need for family support may not have been high. The effects of these factors might explain the slight difference in the level of a fear of COVID-19 held among the respondents in this study despite their varying attributes.

To assess the impact of a fear of COVID-19 on people’s coping behavior, this study

examined effect of a fear of COVID-19 on three types of coping behaviors, including avoidance of contact, focus on health care, and stockpiling, mediated by two reasons for behaviors, including self-determination and tuning to others. These results showed that fear of COVID-19 had a direct impact on all coping behaviors. Intense fear of COVID-19 increases any coping behavior. This supports the report by Yıldırım et al. (2021) that vulnerability, risk perception, and fear of infection increase preventive behaviors, and a strong fear of COVID-19 increases all coping behaviors. On the other hand, tuning into others is a mediating effect on an avoidance of contact and stockpiling. In addition, self-determination showed a mediating effect on avoidance of contact and focus on health care. Tuning into others is unique for increasing stockpiling. Among the reasons for such behavior, a fear of COVID-19 propelled the act of stockpiling on goods through the act of tuning to others. Therefore, it is expected that people with high tuning into others are more likely to be actively engaged in stockpiling because they are strongly influenced by others. In contrast, self-determination is unique in enhancing focus on health care. People with higher self-determination are more likely to increase their focus on health care because of the importance they place on their own judgmental criteria. Such findings imply that avoidance of contact and focus on health care might be instigated voluntarily in some cases and by fear in other cases. The conclusions of this study indicate that the influence of fear on coping behavior is mediated by reasons. In particular,

coping behaviors based on reasons of tuning in to others may lead to inappropriate behaviors such as stockpiling. Conversely, coping behaviors based on self-determination may lead to effective preventive behaviors such as managing one's own health. Therefore, even if the fear of COVID-19 was high, it was suggested that refraining from behaviors based on tuning in to others and promoting behaviors based on self-determination might inhibit inappropriate coping behaviors such as excessive stockpiling and promote appropriate coping behaviors such as hand washing.

There is a need to examine in more detail when the fears of university students become problematic. For example, when fear exceeds a certain threshold, negative effects may be more likely to occur. It is necessary to examine in detail when fear causes problems, rather than just fear as a problem. In addition, it is necessary to compare the fears of university students with those of other groups. Fear among Japanese university students tends to be somewhat higher than in other countries and lower than in other generations in Japan. In this way, it is important to understand the characteristics of the target population and to implement infection prevention measures accordingly.

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Chronically Absent High School Boy Returns to School — Not Creating the Bad Guy —

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ABSTRACT: This is a case study of a high school boy who was chronically absent from school after being bullied in his extracurricular club. Consultations were conducted with IP and his mother over a period of three months until the boy returned to school after the seventh session. Solution construction and false solution patterns based on the double description model were effective in not creating “bad guys” at school or at home. This article summarizes the consultations and discusses methods that do not create “bad guy” players.

KEY WORDS: chronic absenteeism, no “bad guy”, double description model

Introduction

Since 2013, the number of young students who refuse to go to school for 30 days or more during the school year has been on the rise again, and with 144,031 students classified as “chronic absentees” in 2017, schools are faced with a major challenge. This article presents a case study of a high school boy who became chronically absent after being bullied in his extracurricular club and discusses a “no bad guy” method of therapy.

Case study

IP refused to go to school starting in December X-1 and was advised by his club advisor to go to counseling. IP initially said it was “not necessary,” but after six months, he

began saying “maybe I should go to counseling” and decided to come in for a consultation. The clients were a high school boy (“IP”) and his mother, in her 50s (“Mo.”).

IP’s family of five consisted of a father (“Fa.”), Mo., older sister, and older brother (university student).

The main predicament was IP’s hyperventilation, and Mo. was unsure of how to relate with IP. Consultations were conducted first with IP and then with Mo. for a total of seven sessions held over approximately three months, and ended with a return to school.

Consultation 1:

【Consultation with IP】 The catalyst for IP’s hyperventilation was bullying by upperclassmen in his extracurricular club in December X-1. He hyperventilated again the following week in front of his club activities advisor, and he developed a fear of crowds when the hyperventilation continued thereafter. He was unable to attend school for the next two

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months, and although he began to go to the school infirmary in February, he had not attended classes to date. In response to inquiry by the therapist (“Th.”), IP said his objective was to “stop hyperventilating.” He explained that he tended to hyperventilate when confronted by others, and that he was concerned about the frequency of occurrence. He also said that he was “worried about what to do about school,” and in response to the Th.’s request for a breakdown, he said, “70% quit school, 30% continue; I want to keep doing club activities.” He had negative experiences with kids in his class year within the club, and he now felt stronger resistance to them than to the upperclassman.

Th. listened to these events and IP’s current situation and praised his efforts and desire to attend school despite the issues he was facing with his club and hyperventilation. Th. explained the mechanisms of hyperventilation and how it tended to occur with anticipatory anxiety, and said that it would “definitely stop because it is not something that lasts,” and ended the consultation after a final reconfirmation of goals.

【Consultation with Mo.】 Mo. immediately stated, “He told me for the first time this morning that he wants to quit school.” Mo. is torn between wanting IP to continue school and thinking it is okay for him to quit. Fa. apparently wants IP to go to school and continue in his club. IP has recently become more vocal in expressing his anger to others.

Th. explained to Mo. that IP was already changing, and then offered an explanation of

hyperventilation and provided suggestions on how to communicate with IP. Th. also said: “IP will start to act out his anger from now on, and although it might seem like bad behavior, please let it go because it is important for him to get that out.”

Consultation 2:

【Consultation with IP】 IP had not gone to school in the past week, and he did not hyperventilate. When asked about school, he said: “I’m not sure what I think. I feel like I don’t want to go to school, and I’m scared of people, or more like crowds.” It bothered him that he hadn’t “told Fa. that he isn’t going to school.” Fa. is strict and IP is afraid of what he might say when he is in a foul mood, but recently he has been nice and they have been watching sports together on television. When IP came home after having trouble at his club, he was happy when his father told him “you didn’t do anything wrong.” IP has been playing catch with Fa. every day. IP assumes he will have no choice but to work if he drops out of his current school, so Th. offered information about online programs as one of many possible options.

【Consultation with Mo.】 Fa. is aware that IP has not been going to school, but since IP hyperventilated when he was confronted by Fa. before, Mo. and Fa. discussed and decided not to bring up the subject of school. Regarding the fact that IP had not told Fa. about missing school, Th. suggested that “IP might feel like he should make himself look good for Fa., among other feelings.” Th. suggested that Mo. should wait for IP to make his own decision, and Mo.

conveyed a sense of resolve in her reply: “I see, all I need to do is accept him.” Th. suggested in regard to IP and Fa. that, rather than having Fa. do something, the parents should share information and understand the current situation.

Consultation 3:

【Consultation with IP】 When asked about changes over the past week, IP replied: “No change, but I have stronger feelings about quitting school.” He told Mo. that “it’s okay to tell Fa. that I’m not going to school.” He cannot tell Fa. himself because he does not know what Fa. will say. From IP’s perspective, Fa. coached him in sports and was strict with rules, but stopped saying things when IP started his second year of junior high school. Th. commented, “Fa. seems to have ideals about raising and educating you, but what do you think?” IP responded, “I don’t think what Fa. has said is wrong” and “I’m fine with our relationship the way it is.” IP is anxious that he will be called back to school if Mo. tells Fa. that he is not going to school.

Th. suggested that “it’s important to be honest with Fa. about your feelings.” Considering that IP might hyperventilate when talking to Fa. despite not having hyperventilated recently, Th. taught IP a 10-second breathing technique and ended the consultation after practicing together.

【Consultation with Mo.】 Recently, IP has been going to practices for the sports team he used to belong to, and he often talks about his own past accomplishments. He has also told

Mo. about his frustration and anger with his club when his belongings went missing or things he had lent out were not returned.

Th. stated: “Participating in sports practice is a positive change. IP needs to feel secure right now, and with a greater sense of assurance, he will be able to think about the future. Once IP talks to Fa., please be accepting of his feelings as parents. Rather than trying to rush results, focus on first accepting his feelings about not wanting to go to school.” Mo. inquired at the end about getting a written opinion to submit to school to adjust the number of IP’s days of absence.

Consultation 4:

【Consultation with IP】 IP did not end up talking to Fa. about not going to school during the two weeks since the previous session, but he realized that Fa. knew when Fa. said “it’s about time you get back.” When Th. asked, “What could you do to make yourself feel like you want to continue with your club at your current school,” IP responded, “I don’t know how I feel recently. My homeroom teacher from 3rd year of junior high told me to come talk if I need to, so I think I might go. I don’t know what I should do, if I should quit school or not.” Th. told IP, “You have a lot of strengths both inside and outside, so I want you to focus on enjoying your life without thinking about school right now.”

【Consultation with Mo.】 A positive change over the past two weeks has been that IP has gotten up by himself in the morning, albeit at a late hour. IP said that he wants watch his club’

s regional competition in person, but Mo. is worried about him going to event.

Th. commented: “Fa. chose his words carefully in saying ‘it’s about time you get back.’ Usually, people tend to say things like ‘go to school.’ IP’s scope of activity is expanding, and he has more energy, so please continue on in the same way.”

Consultation 5:

【Consultation with IP】 Over the past two weeks, IP had a good time going to a summer festival with friends from his elementary and junior high schools and attending a pro sports game with Mo. When Th. asked what he was thinking about school, IP stated: “I went to see my junior high teacher and talked honestly about how I wasn’t going to school. After talking with my friends and teacher, I am starting to feel a little like going back.” He scaled his feelings about returning to school: “About 50. My friends and teachers said “it would be a waste” and I’m thinking I should probably go back to my current school.” Th. inquired, “What do you need to raise that from 50 to 60 or 70?” and IP replied, “I think if I talk to my club peers and my teachers.” Fa. offered the words: “Be ready if you’re going to go back to your club. You just have to rise from the very bottom to the very top.” Th. said “Continue to enjoy this time and pay attention to your current feelings.”

【Consultation with Mo.】 IP has been enjoying himself over the past two weeks as well, and the parents did not raise the subject of school or club. IP stopped by Mo.’s workplace,

went to summer festival with friends, and met up with his teacher from junior high school. Th. commented: “It took significant energy to meet with his friends and teacher. The fact that he was able to talk about not going to school shows that it is becoming something of the past for him. This is a good development for IP.” Mo. said that IP has started to talk about school himself, and she has noticed a change in him also.

Consultation 6:

【Consultation with IP】 The change over the past three weeks was going by himself to watch regionals. He saw the classmates he doesn’t like, but it didn’t bother him. IP said “Tomorrow is the opening ceremony at school, so I’d like to go. I’d like to go back to school in September if I can.” He felt “80% sure and 20% unsure because I’d be nervous” about attending the opening ceremony. Th. praised IP’s determination to go back to school but stated: “You feel 80% sure about going, but feelings can change, so you might have different thoughts as the time draws closer. It might be difficult for you to go, but in that case, you can just try again later.”

【Consultation with Mo.】 IP has not shown any particular change at home. He went out on his own to cheer his team, and he had talked with dorm friends on the phone. IP hinted at going back to school, and Mo. expressed her feelings so far: “There are many things that I’ve wanted to say. The club advisor told me that he has also been ‘holding back from contacting IP so that he wouldn’t feel

pressured,” and Fa. has also avoided the subject of school.” Th. wrapped up the session with: “It’s difficult to wait, but everyone, including the family, is facing the same direction. Please continue just as you are.”

Prior to Consultation 7, Mo. called to request a written opinion to submit to school, and was rescheduled the session for an earlier date.

Consultation 7:

【Consultation with IP】 In the two weeks since the last session, IP went to school for three days, including for a school event. He was able to speak with his teacher about future plans and felt relieved after speaking with upperclassmen and peers in his club. Th. praised IP’s attendance and asked, “What do you think made it okay for you to go to school?” IP said, “There was summer vacation, and when I saw nationals, I wanted to do my club.” IP reviewed the content of the written opinion. The consultation ended after Th. offered feedback on IP’s process of change and the resources available to him.

【Consultation with Mo.】 IP was not able to attend the opening ceremony, but he went to school for three days after that. He talked a lot at home, laughed aloud and was more cheerful. Fa. did not change his behavior whether or not IP went to school, and plays catch with IP. Discussed how to submit the written opinion and decided on having IP hand it directly to his teacher at school.

Th. stated: “It is a great thing that IP was

able to go to school. It’s important to take it little by little now, and that will tie into permanence. He may get tired and not go sometimes, but please continue to go about in the same way, without changing anything.”

Although another session was planned, it was canceled because IP returned to school and had a busy schedule.

Discussion

IP began avoiding school due to hyperventilation triggered by his relationships with upperclassmen and peers in his extracurricular club. He may have also been impacted prior to such events by pressure from his classmates when he was benched in his first year and by his inability to speak his mind at school or at home (particularly with his father) and his tendency to hold things in.

At the initial consultation, IP wanted to address his hyperventilation and he had stronger feelings about leaving school rather than returning. Taking this into account, Th. proposed a goal of stopping the hyperventilation. Th. provided Mo. with an explanation of hyperventilation and proposed ways to relate to IP. There was no recurrence of hyperventilation thereafter. Mo. commented in Consultation 2, “I see, all I need to do is accept him,” and seemed to convey a stance of “watch and wait” that presented a false solution and contributed to the changes in IP as well. The parents shared information, and Fa. reached out to IP with supportive words such as “you didn’t do anything wrong,” “it’s about time you get

back,” and “you just have to rise from the very bottom to the very top.” IP also had many resources available and his teachers and friends were a source of energy.

From the perspective of a double description model (Wakashima & Hasegawa, 2000) that combines the MRI approach and solution-oriented approaches, IP may have benefited from secondary changes brought about solution talk and use of resources, Mo.’s resolution and false solution patterns, and a focus on enjoying life as opposed to thinking about how to go back to school. It should also be noted that Th. did not refer to the events with clubmates in the context of “bullying.” By conveying to IP that Fa. was not so much an intimidating presence that he could not talk to, but that IP might feel like he should make himself look good for Fa., and that Fa.’s strictness might come from his parenting and educational ideals, Th. also reframed Fa. so as not to create a “bad guy.” This lack of a “bad guy” at school and at home may have reduced IP’s resistance to going back to school and helped him to take the first step.

Reference

Wakashima, K. & Hasegawa, H. (2000). *Yoku wakarū tanki ryouhou gaido bukku* [Brief Therapy Guidebook]. Kongo Shuppan.