

Collapse of Groups due to the COVID-19 Pandemic and Group Resilience
in Varsity Sports Teams.

尾 関 美 喜 ・ 吉 村 利 佐 子 ・ 酒 向 治 子
Miki Ozeki ・ Risako Yoshimura ・ Haruko Sako

岡山大学大学院社会文化科学研究科紀要
第56号 2023年12月 抜刷
Journal of Humanities and Social Sciences
Okayama University Vol.56 2023

Collapse of Groups due to the COVID-19 Pandemic and Group Resilience in Varsity Sports Teams

Ozeki, Miki^{*}, Yoshimura, Risako^{**}, and Sako, Haruko^{***}

Introduction

Many sports teams and clubs at universities restricted their activities due to the COVID-19 pandemic in the spring of 2020, which forced these groups to be in a state without substance even though they continued socially and their members remained. Thus, they were disrupted by external pressure against members' will. The study explores how their members cope with this hardship.

Groups Collapsing due to the COVID-19 Pandemic

Under COVID-19 restrictions by universities, university sports teams had been disrupted as they failed to meet the four conditions for the formation of a group by Levine and Moreland (1994) : interaction, emotional bond, and interdependence among members, as well as the existence of group norms. As members struggled to interact with each other, their mutual emotional bond was affected, failing to meet two of the four conditions for the formation of a group by Levine and Moreland (1994). In team sports, banning group activities caused a loss of interdependence among members. They are highly interdependent because they cannot play sports without an adequate number of people to form a team. Hence, they did not meet another condition required to make a group. Group norm loses its meaning as universities ban activities as its primary goal is to ensure cooperation among members. Then, sports teams in universities could not meet the four conditions that make a collection of people into a group, as proposed by Levine and Moreland (1994). Thereby, they had been disrupted as their activities were restricted due to the COVID-19 pandemic in the spring of 2020.

Group Resilience

The definition of resilience differs in various academic fields. The concept was

* Faculty of Humanities and Social Sciences, Okayama University · Associate Professor

** The Joint Graduate School (Ph.D. Program) in Science of School Education Hyogo University of Teacher Education · Doctoral Student

*** Faculty of Education, Okayama University · Professor

originally used in developmental psychology, as a psychological feature that leads an individual to his/her well-being despite hardships and ensures psychological elasticity for an individual to recover from stressful events (Ishige and Muto, 2006). In human engineering, it refers to the power that systems require to recover to normal, if they face unexpected events and errors (Haseegawa and Hayase, 2012). Both these definitions identify resilience as the power to recover to normal state, if an individual experiences hardship and becomes abnormal. In organizational psychology, group resilience is sometimes referred to as team power that enhances morale in a team when it faces hardship (Kikuchi and Yamaguchi, 2012). However, Ozeki et al. (2015) disagreed with Kikuchi and Yamaguchi (2012) because the latter's understanding of resilience was in the organizational climate, even though the former reiterated that group resilience was an ability of a group.

In resilience engineering, resilience has been treated as a power that a group has (Reason, 2006), and not part of the organizational climate. This definition agrees with developmental psychology and human engineering by identifying resilience as a power to recover from hardship and undesirable events; however, they differ in treating resilience as a power of a group. Resilience engineering also focuses on actual human behaviors (Westrum, 2006) and coping with undesirable events before, during, and after them (Westrum, 2006). Thus, the definition of resilience in resilience engineering overcomes faults of studies that treated group resilience like organizational climate (Hollnagel et al., 2001; Kikuchi and Yamaguchi, 2012; Wreathall, 2001) or organizational system to prevent undesirable events (Patriarca et al., 2018), and seems to define group resilience better. Treating group resilience as part of organizational climate or an organizational system makes it impossible to explain immediate and effective coping by group members when faced with undesirable events. Moreover, components of their group resilience were not confirmed whether they were effective or not in settling the situation.

Ozeki et al. (2015), which the present study is based on, treated group resilience as actual members' behaviors while collectively coping with hardship. Further, we set four components of group resilience based on Westrum (2006) : "ability to prevent bad things from happening," "ability to keep bad things from getting worse," "ability to recover from an accident after its occurrence," and "ability to maintain activity levels." The "ability to prevent bad things from happening" is being cautious of unexpected hardship (Reason, 2006), and it refers to proactively resolving a problem. The "ability to keep bad things from getting worse" and "ability to recover from an accident after its occurrence" reflect the definition of resilience

in developmental psychology. The “ability to maintain activity levels” is continuing the normal activities of a group even in the middle of hardship. Ozeki et al. (2015) assessed group resilience by counting concrete behaviors of members while facing hardship for their groups, and not by assessing individual perceptions using a questionnaire. They captured coping with hardship for a group as a sequence of some behaviors of the individual members, and not as the ability of individuals to cope. They set a sequence as a single case in which group resilience emerged. Group resilience had been merely a theoretical concept by Westrum (2006) and Reason (2006) until it was adopted for empirical research by Ozeki et al. (2015) using data obtained from training in the flying team of a university. This method absolved the shortcomings of previous studies which captured group resilience as part of organizational climate, even though they insisted group resilience was an ability of a group (Ozeki et al., 2015).

Sports teams in universities would use group resilience to cope with and try to prevent the collapse of a group due to the COVID-19 pandemic. However, this hardship is too rare for teams to find effective coping methods from similar experiences. It is impossible for researchers to build any hypothesis for resilience in such catastrophes based on previous studies because this hardship is too rare to find previous references. Hence, this study explores how group resilience by Ozeki et al. (2015), which identifies the “ability to prevent bad things from happening,” “ability to keep bad things from getting worse,” “ability to recover from an accident after it has already occurred,” and “ability to maintain activity levels,” could be used by teams to overcome group collapse without a specific hypothesis.

Method

In this paper, analysis is carried out using the idea of mixed research methods: quantitative analysis and its result which fits a main purpose of current study comparing frequency and their effectiveness of four types of group resilience using validated method in previous research by Ozeki et al. (2015) and complementary qualitative result. The latter result would offer better understanding what happened in collapse of a group. Mixed method design uses the typology qualitative to emphasize the quantitative phase and complementary role of the qualitative phase (Creswell and Plano Clark, 2011). Using these two complementary analysis to data obtained interviews enables us to describe how groups cope with an unforeseen catastrophe.

Participants

The present study included five male and five female interviewees, and all of them were in the fourth grade at the university when the interviews were conducted from October to December 2021. They belonged one of soccer team, volleyball team, basketball team, or baseball team. Some of them joined matches in 2021 as players. Others retired in 2020 and sometimes joined for practices and helped younger members. Interviewees were core members of their teams, both in management and in matches when the COVID-19 pandemic started. They had experienced normal face-to-face activities and practices, with their elder and younger members for two years. Hence, they learned to manage their teams by observing their elder members. There were three teams to which two of the interviewees belonged, and there was one team to which the three interviewees of this study belonged.

Background of teams which the participants belonged to

Their university ordered that all of its sports teams and varsity clubs should stop their activities to prevent the spread of COVID-19. Members of these groups were not allowed to gather for practices and meetings, and they were banned from joining any competition. The university allowed them to restart their activities. However, only three members were allowed to practice at a time, and they must go through various infection control measures and procedures that the university imposed. Teams that were the target of the present study could not play with three members; hence, they could not practice. After a few months, some teams started a campaign to collect signatures seeking permission to participate in matches because most team members of the target teams in this study pursued to win games to get promoted to upper leagues and to brush up their technique to contribute to victory. They were not competent at national levels, however, they were victory oriented. It was successful and teams were allowed to participate in matches after going through the procedures imposed by the university.

Ethical Considerations

Prior to the implementation of this research, it was reviewed and approved by the Research Ethics Review Committee of Faculty of Humanities of Social Sciences and Law, Okayama University (approval number 2021-01).

Materials

Semi-structured interviews were conducted from October to November 2021. The interview duration was around one hour. Interviewees were asked the following questions:

“What restrictions were imposed on your team as part of COVID-19 prevention measures?”, “What hardships did your team experience since the COVID-19 catastrophe?”, “What did your team do to address such hardship? What was the result?”, and “Did your team have any regrets about how you addressed those issues? If yours did, what was it?”

Procedure and Analysis

The first author and a cooperator who was a junior and a member of a sports team in the university identified “hardship” from narratives. Then, they classified the team’s response to cope with the “hardship” into one of the following themes in a manner similar to a previous study (Ozeki et al., 2015) : “ability to prevent bad things from happening,” “ability to keep bad things from getting worse,” “ability to recover from an accident after its occurrence,” and “ability to maintain activity levels.” In the present study, the “ability to prevent bad things from happening” indicated “what the team did for the “hardship” to not cause another hardship. The “ability to keep bad things from getting worse” referred to what the team did to prevent the existing “hardship” from getting worse. The “ability to recover from an accident after its occurrence” referred to “what the team did to overcome or solve the “hardship.” The “ability to maintain activity levels” suggests “what the team did to continue face-to-face practices and joining matches.” Following these criteria set by the first author and the cooperator, they classified what teams did to cope with “hardship” into a single resilience. The cases where the interviewee referred only to the “hardship” without mentioning the team’s response, were labeled as “doing nothing.”¹

It was appropriate for this study to treat coping with “hardship” as one group-level phenomenon, when interviewees in the same team describe the same “hardship” and the same coping, as difficulties faced by the group and not individuals in this study. However, the information each member obtained would be different depending on the position in the team. It was too difficult for members to share information especially when the teams were totally stopped from doing their activities. Hence, in some cases, two interviewees talked about the same “hardship,” however, they referred to more than two different coping strategies; thereby they were treated as two different coping methods toward one hardship.

In classification, when interviewees in the same team referred to the same “hardship” and had the same narrative about coping with the same “hardship,” it was treated as one coping method. The “ability to maintain activity levels” were used one time when two interviewees in the same team had the same description and both referred to the “ability to maintain activity levels.” Two different resilience components were applied when interviewees in the

same team referred to different resilience components toward the same “hardship”: when one of the two members in the same group referred to the “ability to prevent bad things from happening” and the other referred to the “ability to keep bad things from getting worse.”¹ Two different resilience components were used when one interviewee referred to two different coping methods towards one “hardship,” following Ozeki et al. (2015).

The result was labeled “successful” when the result of coping was positive, and the result was labeled “failed” when the result of coping was negative. “Unknown” was the label when an interviewee referred to coping but did not mention its results. Other cases were labeled as “unclassifiable.” “Unclassifiable” included the hardship that was independent to the team and members like “the tournament was canceled” and “members were puzzled by the fact that the match format was different from the one they had played before due to COVID-19 regulations.” The agreement ratio of the classification of four components of group resilience and its result by the first author and the cooperator was 91%. If the classification results differed, it was determined through discussion.

Results

Quantitative Results

Fisher’s exact test and residual test were conducted based on Table 1 whose independent variables were group resilience and result of resilience². Result (χ^2 (12) =109.99, $p<001$) showed that the number of “doing nothing” and “unclassifiable” were significantly large ($z=9.7$, $p<.01$), and this was the largest in both in line ratio and column ratio. The number of “doing nothing” and “successful” was significantly small ($z=-5.3$, $p<.01$). The number of the “ability to recover from an accident after its occurrence” and “successful” was also significantly large ($z=3.4$, $p<.01$). The number of the “ability to keep bad things from getting worse” and “failed” ($z=2.0$, $p<.05$) as well as the number of the “ability to maintain activity levels” and “successful” were both significantly large ($z=2.3$, $p<.05$). The number of the “ability to prevent bad things from happening” and “unclassifiable” ($z=-2.0$, $p<.05$) as well as the number of the “ability to keep bad things from getting worse” and “unclassifiable” ($z=-2.6$, $p<.05$) were both significantly less. The number of the “ability to recover from an accident after its occurrence” and “unclassifiable” was significantly small ($z=-5.1$, $p<.01$). The number of the “ability to maintain activity levels” and “unclassifiable” ($z=-2.3$, $p<.05$) as well as the number of “doing nothing” and “unknown” ($z=-3.8$, $p<.01$) were significantly small.

Table 1 Group resilience used in groups and its results.

group resilience		result of coping				total
		unclassifiable	unknown	failed	successful	
Ability to prevent bad things from happening	frequency	1 ^a	6 ^b	4 ^{a,b}	11 ^b	22
	line ratio (% of group resilience)	4.50%	27.30%	18.20%	50.00%	100.00%
	column ratio (% of result of coping)	2.50%	25.00%	11.40%	22.40%	14.90%
	percentage of whole table (% of sum total)	0.70%	4.10%	2.70%	7.40%	14.90%
		(-2.6)**	(1.5)	(-0.7)	(1.8)	
Ability to keep bad things from getting worse	frequency	1 ^a	5 ^a	7 ^a	3 ^a	16
	line ratio (% of group resilience)	6.30%	31.30%	43.80%	18.80%	100.00%
	column ratio (% of result of coping)	2.50%	20.80%	20.00%	6.10%	10.80%
	percentage of whole table (% of sum total)	0.70%	3.40%	4.70%	2.00%	10.80%
		(-2.0)*	(1.7)	(2.0)*	(-1.3)	
Ability to recover from an accident after it has already occurred	frequency	0 ^a	11 ^b	12 ^b	25 ^b	48
	line ratio (% of group resilience)	0.00%	22.90%	25.00%	52.10%	100.00%
	column ratio (% of result of coping)	0.00%	45.80%	34.30%	51.00%	32.40%
	percentage of whole table (% of sum total)	0.00%	7.40%	8.10%	16.90%	32.40%
		(-5.1)**	(1.5)	(0.3)	(3.4)**	
Ability to actively maintain activity levels	frequency	0 ^a	2 ^{a,b}	3 ^{a,b}	8 ^b	13
	line ratio (% of group resilience)	0.00%	15.40%	23.10%	61.50%	100.00%
	column ratio (% of result of coping)	0.00%	8.30%	8.60%	16.30%	8.80%
	percentage of whole table (% of sum total)	0.00%	1.40%	2.00%	5.40%	8.80%
		(-2.3)*	(-0.1)	(-0.1)	(2.3)*	
Do nothing	frequency	38 ^a	0 ^b	9 ^c	2 ^b	49
	line ratio (% of group resilience)	77.60%	0.00%	18.40%	4.10%	100.00%
	column ratio (% of result of coping)	95.00%	0.00%	25.70%	4.10%	33.10%
	percentage of whole table (% of sum total)	25.70%	0.00%	6.10%	1.40%	33.10%
		(9.7)**	(-3.8)**	(-1.1)	(-5.3)**	
total	frequency	40	24	35	49	148
	line ratio (% of group resilience)	27.00%	16.20%	23.60%	33.10%	100.00%
	column ratio (% of result of coping)	100.00%	100.00%	100.00%	100.00%	100.00%
	percentage of whole table (% of sum total)	27.00%	16.20%	23.60%	33.10%	100.00%

Note. Values inside () represent degrees of freedom adjusted residuals. The same suffix is listed between columns (group resilience) ratios that do not show a significant difference at the 5% level.

* $p < .05$, ** $p < .01$

A significance test for column proportions (Bonferroni) was conducted, and the same suffix is listed between columns (group resilience) ratios that do not show a significant difference at the 5% level in Table 1. The results of the significance test of line ratio (result of resilience) showed that there was no significant difference among four components of group resilience in all the results; “successful,” “failed,” “unknown,” and “unclassifiable,” which meant that the effectiveness of four components of group resilience was not different.

Qualitative Results

Examples of the “Ability to Prevent Bad Things from Happening”

We, my batch mates and one-year younger members, are close. We know that one-year younger members totally worship us. However, one-year younger members have a strained relationship with two-year younger members. They are not close to each other. (snip) Worsening the situation, two-year younger members look down on one-year younger members. (Interviewee C)

The relationship between peer group members completely changed after the onset of the COVID-19 pandemic in this team. At least in 2020, such change had not yet caused any specific problem in the team, only their relationship based on age had changed. Then, this case was counted as an example of the “ability to prevent bad things from happening.” Elder members told sophomores in 2020 to communicate with their younger ones more to prevent causing problems for their team; however, the bad relationship between sophomores and freshmen did not change.

Some members were beginners; they started this sport at the university. Such members had sometimes difficulties when they practiced with other skillful players. Differences between members in skills sometimes limit the variation of practices. So, we were mindful of this problem when we were allowed to practice in three members. (Interviewee H) The team interviewee H belonged was bothered that the three members’ small practice teams generated were inappropriate due to differences in skills when they tried for each member to play with different members each time. They carefully composed three-member teams, recorded their practices, and shared them among elder members. In this way, they tried not to limit the variation of practices and they tried to accomplish better practices.

Examples of the “Ability to Keep Bad Things from Getting Worse”

We were losing our motivation toward matches. We could not maintain our motivation when the matches were called off and we did not know the schedule of the next matches. We were at a loss because we did not know how hard we practiced. It was a tough time. (Interviewee J)

The bad thing in this example was the decrease in team members’ motivation. Elder members attempted to encourage younger members to not lose their motivation, but it failed. Younger members were often just watching in online meetings because the elder members talked more. Such situation decreases motivation of younger members in online meetings. (Interviewee C)

In interviewee C’s team, members of offensive positions and members of defensive

positions respectively held online meetings to think of their performance watching their teams' past games. They divided online meetings into younger and elder teams to cope with younger members' unspoken participation in the meetings. They coped with this problem of younger members' losing their motivation in online meetings by making every member do a presentation. Members presented on their weaknesses in matches and how to improve them.

Examples of the “Ability to Recover from an Accident after it has Already Occurred”

Members saw each other only in practices even after activities restarted. Any drinking parties or going to meals together were banned by universities at that time. I saw freshmen and sophomores only in practices, and I was at a loss in forming a rapport with them. It was an uncomfortable situation. I felt uncomfortable and I wanted to get close to them, but I did not know what to do. I could not approach them more. If we had had chances to talk in matches outside the university and more practices, I would have gotten closer to them. (Interviewee F)

All the interviewees mentioned that it became extremely difficult to develop good relationships between members, especially relationships with other grade students compared to how it was before the COVID-19 pandemic. They said that they struggled because of severe restrictions on their activities while practicing only three members at a time. They also said that banning drinking parties and going for meals also caused a difficult situation. In interviewee F's team, seniors who had already retired came to practice and talked to younger members, and members held meetings to share their purpose.

Our coach told us to do practices... Whatever each member can do alone at home, like running by ourselves. (Interviewee B)

Some members went to the gym and did something using a ball, but I do not remember whether I told the members to do specific practices or muscle training. I remember that I arranged for each member to take a ball home to practice. (Interviewee H)

All the teams were banned from doing activities, hence, members could do nothing other than practice alone. Coaches and captains told what to do in some teams, and members decided what to do in others.

Examples of the “Ability to Maintain Activity Levels”

Why can't we do anything even though teams of universities in other prefectures practice as usual? (snip) Some people said that it was good to cooperate in a campaign for collecting signatures to participate in matches and other teams in our university would also be allowed to participate in matches then, but they also said that our efforts would be nothing

if someone infected with COVID-19. They tested negative. Others cooperated in the campaign. (Interviewee E)

Interviewee E noted that a campaign for collecting signatures to participate in matches began when most students in sports teams complained repeatedly that their university did not allow practices and participation in matches even though teams of other universities could do it. Some students in a sports team called members of other teams and asked them to cooperate with the campaign. The campaign was successful, and teams were allowed to participate in matches after going through various infection control measures and procedures imposed by the university. Interviewee G stated that “Juniors in 2021 do not know how to hold and manage events at all. I am afraid that they could not teach younger members anything about procedures for matches.”

Interviewee G taught one-year younger members procedures of matches and how to hold and manage events in the team, based on experiences before the pandemic, however, one-year younger members could not pass that knowledge down to their juniors. One-year younger members of interviewee G had never experienced matches and events, hence, they could not teach anything. This case was the “ability to maintain activity levels” turned to end to tears.

Example of “Doing nothing”

When they restarted their activities and were allowed to practice with only three members in every practice, the team climate absolutely changed and relationships among members were still tenuous. Interviewee F’s description represented this situation well: Younger members do not understand our tradition at all. Team climate was totally changed after the COVID-19 pandemic. Our generation valued briskly climate in our team, but the team climate became rude after recurring banning and restart of activities. Younger members seemed that they were allowed to cut practices easily.

No teams coped with such change in team climate, and interviewees did not explain what was brought about by such climate change.

Discussion

First, caution in interpreting the results of the present study is needed because there were some cells whose observed frequency was less than 5 in the cross-tabulation table. Most difficulties were not coped with or remained unaddressed since the group collapse by external pressure was an unforeseen crisis. Interviewer B stated, “I had thought positively that COVID-19 was like influenza, and we would start practices in one month. However, the banning of activities was extended repeatedly,” which described that members had never

imagined that their team would experience a social psychological collapse due to external pressure. Thus, it was extremely difficult for them to learn how to cope with such a crisis by observing their elder members and obtaining skills to deal with unexperienced difficulties (Levine and Moreland, 1994). Hence, the members would not know how to cope with the situation at all, and many difficulties remained unsolved; the ratio of “doing nothing” was 33%. Furthermore, the remaining unsolved difficulties seldom turned into positive results. We noted that the test result for column proportion difference effectiveness of four components of group resilience was not different, though the frequency of four components of group resilience differed.

Even under the social psychological collapse of a group owing to external pressure, The “ability to recover from an accident after its occurrence” was used most frequently and with considerable effect when group members still had the will to continue with their activities and want their group to exist. The “ability to maintain activity levels” was used frequently the least; only 8%, since these tactics could be used in similar situations before the COVID-19 pandemic. The “ability to prevent bad things from happening” was not used much because it enabled groups to find and proactively solve problems (Westrum, 2006). Such tactics would be used less frequently when incidents with strong impact gather members’ attention (Latané, 1981) like the collapse of their group, and members failed to find problems to use that ability. The “ability to keep bad things from getting worse” can be used more frequently than the “ability to prevent bad things from happening,” immediately after the group’s collapse because the “ability to keep bad things from getting worse” would be used after a problem has already happened. Nevertheless, the “ability to prevent bad things from happening” was approximately 15%, and the “ability to keep bad things from getting worse” was around 10% in the cross-tabulation table. The frequency of four group resilience would change as time passed and it cannot be discussed in the current study. The “ability to recover from an accident after its occurrence” might be used soon after the crisis by members who paid attention to the outstanding difficulties and worked on them. After time passed, the “ability to actively maintain activity levels” and the “ability to prevent bad things from happening” might be used more frequently and the frequency of the “ability to recover from an accident after its occurrence” might decrease. Further longitudinal interviews will reveal whether the frequency of the four components of group resilience would change with time.

All the interviewees mentioned the reduction of intimacy within their teams, and they said that the ban on having meals with others because of COVID-19 restrictions caused

this difficulty. Before the COVID-19 catastrophe, members of each team often had meals with elder and younger members and were bonding together. Interviewees and their one-year younger members did well because they had spent time together before 2020; however, they did not get along with two-year younger members. One-year younger members and two-year younger members could not get acquainted either. Such a reduction of intimacy was seen in all teams. Interviewees stated that direct interactions were important to building good relationships among members.

Most teams sometimes held online meetings, but it did not prevent the group's collapse. Online meetings using Zoom were often held during their activity ban to keep interpersonal relationships among members. However, empathy is not evoked in online communications (Kawashima, 2022), as interviewees A and D pointed out: *“we could not share our feelings and enthusiasm in online meetings.”* Teams could not recover from collapse only using online communication because empathy, which is the basis of emotional bonds and interdependence among team members (Anderson and Keltner, 2002), never arises.

Teams might not recover from collapse until members physically gather. Team members learn how to cope with conflicts, and they start identifying with their ingroup (Gray and Manning, 2022). This is essential for the collection of people to become a group (Ozeki, 2015), however, members could not maintain it with online communication.

Team traditions were lost in the COVID-19 pandemic, and members failed to solve this problem. This problem was referred to as “our generation failed to pass down team traditions” (Interviewee E) and as follows by interviewee G:

We have not had any events in our teams since the onset of the COVID-19 pandemic. Sophomores oversee holding events in our team, but they do not know how to hold them because they did not experience those events. Such situations brought discontinuance in our tradition, and traditional events in our teams would never be held in the future. (Interviewee G)

No interviewees referred to any concrete bad effect caused by the loss of their tradition and team climate; however, the impact may be seen in the future when younger generations would be solely in charge of managing their team.

Limitations

Our findings are valuable to understand how groups cope with an unforeseen catastrophe. It was obtained in an extremely rare situation, the COVID-19 pandemic, targeting sports teams in a university, which might be influenced by some other unique

elements. This might generate a unique pattern for the frequency of each element used in group resilience.

The restriction of sports team activities and practices in universities had no precedence. They could not fulfill the four requirements to form a group because of external pressure, even though they were still existing as social categories. Previous studies proposed group developmental theories like Group Developmental Model by Tuckman (1965) and Group Socialization Model (Levine and Moreland, 1994). They had inadequate references on the process for groups collapsing and recovering from that (Forsyth, 2010). Additionally, these and case studies like Birnbaum and Cicchetti (2005) focused on cases where members accepted the collapse and groups that had already been determined from the beginning to disband like experimental groups and therapy groups.

Further follow-up interviews with younger members who belonged to the target team in this study will be needed in the following years to understand the process of recovery in detail. Responses obtained from interviewees suggested that it is difficult for groups to recover from its collapse, and it would take a long time to do ordinary activities that they used to do before the pandemic.

References

- Anderson, C., and Keltner, D. (2002). The role of empathy in the formation and maintenance of social bonds. *Behavioral and Brain Sciences*, 25 (1), 21–22.
<https://doi.org/10.1017/S0140525X02230010>.
- Birnbaum, M. L., and Cicchetti, A. (2005). A model for working with the group life cycle in each group session across the life span of the group. *Groupwork*, 15 (3), 23–43,
<https://doi.org/10.1921/0951824X.15.3.23>.
- Creswell, J. W., and Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). SAGE Publications.
- Cochran, W. G. (1954). Some methods for strengthening the common χ^2 tests. *Biometrics*, 10(4), 417–451. <https://doi.org/10.2307/3001616>.
- Forsyth, D. R. (2010). *Group dynamics* (fifth edn.). Cengage Learning.
- Furniss, D., Back, J., Blandford, A., Hildebrandt, M., and Broberg, H. (2011). A resilience markers framework for small teams. *Reliability Engineering and System Safety*, 96 (1), 2–10. <https://doi.org/10.1016/j.res.2010.06.025>.
- Gray, D., and Manning, R. (2022). Constructing the places of young people in public space:

- conflict, belonging and identity. *British Journal of Social Psychology*, *61* (4), 1400–1417. <https://doi.org/10.1111/bjso.12542>.
- Hasegawa, N., and Hayase, K. (2012). Discussion on future direction of safety culture: based on review of safety culture, high reliability organization, and resilience. *Central Research Institute of Electric Power Industry Reports*, L11015.
- Ishige, M., and Muto, T. (2006). Resilience and personality traits in junior high school students. *Japanese Journal of Personality*, *14* (3), 266–280. <https://doi.org/10.2132/personality.14.266>.
- Kawashima, R. (2022). Experiment reveals that empathy does not occur in online conversations: one of the reasons is misalignment of gaze. *Shuukanshincho*, vol. <https://www.dailyshincho.jp/article/2022/05010556/?all=1>.
- Kikuchi, A., and Yamaguchi, H. (2012). A clue to synthetic understanding of resilience in organization: recomposition by crossing two dimensions of time-series and different of objects. *Journal of Human Interface Society*, *14*, 103–108.
- Latané, B. (1981). The psychology of social impact. *American Psychologist*, *36* (4), 343–356. <https://doi.org/10.1037/0003-066X.36.4.343>.
- Levine, J. M., and Moreland, R. L. (1994). Group socialization: theory and research. *European Review of Social Psychology*, *5* (1), 305–336. <https://doi.org/10.1080/14792779543000093>.
- Ozeki, M. (2015). Group-level group identity as a basis of a group. *Group Dynamics: Theory, Research, and Practice*, *19* (3), 166–180. <https://doi.org/10.1037/gdn0000030>.
- Ozeki, M., Yonezawa, K., and Negayama, K. (2015). Group resilience in incidents of varying degrees of danger and frequency. *Japanese Journal of Social Psychology*, *31*, 1–12. https://doi.org/10.14966/jssp.31.1_13.
- Patriarca, R., Di Gravio, G., Costantino, F., Falegnami, A., and Bilotta, F. (2018). An analytic framework to assess organizational resilience. *Safety and Health at Work*, *9* (3), 265–276. <https://doi.org/10.1016/j.shaw.2017.10.005>.
- Reason, J. (2006). *Human contribution: unsafe acts, accidents and heroic recoveries*. Ashgate Publishing Company.
- Tuckman, B. W. (1965). Developmental sequence in small groups. *Psychological Bulletin*, *63*, 384–399. <https://doi.org/10.1037/h0022100>.
- Westrum, R. (2006). A typology of resilience situations. In E. Hollangel, D. D. Woods, and N. Leveson (Eds.), *Resilience engineering* (pp. 55–66). Ashgate Publishing Company.
- Woods, D. D. (2015). Four concepts for resilience and the implications for the future of

resilience engineering. *Reliability Engineering and System Safety*, 141, 5–9.

<https://doi.org/10.1016/j.res.2015.03.018>.

Wreathall, J. (2011). Monitoring: A critical ability in resilience engineering. In E. Hollnagel, J. Paries, D. D. Woods, and J. Wreathall (Eds.), *Resilience engineering in practice: a guidebook* (pp. 61–68). Ashgate Publishing Company.

Footnotes

1. In resilience studies, criteria for classification and definitions of resilience components are inevitably set based on components of resilience theory on which that study stands (Furniss et al., 2011). Differences in research targets make classification criteria different from previous studies even if the research and previous studies are based on the same theoretical framework. They cause the difference in classification criteria of resilience components among studies, which is unsolved issue in resilience studies (Woods, 2015).
2. Fisher's exact test, not the χ^2 test, was used because there were some cells whose observed frequency was 0 in the cross-tabulation table. It is applicable in such cases where only observed frequencies obtained are concerned (Cochran, 1954). The test statistic obtained for Fisher's exact test was the same as in χ^2 tests by SPSS.

