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The role of synchronous online classes in helping university students to cope with COVID-19 distress

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1 Introduction and background

This study quantitatively examines whether synchronous online classes –classes conducted over real-time communication platforms such as Zoom, Google Meet– can help university students in Japan cope with distress caused by the COVID-19 pandemic.

The COVID-19 pandemic has brought unprecedented, and sometimes devastating, impacts to all sectors of society. In Japan, a recent study (Ueda, Nordström, & Matsubayashi, 2021) has found an alarming pattern that the 2020 suicide rates of young women and university students have increased noticeably from past pre-COVID-19 years.

On top of having to face the threats and disruptions brought about by the pandemic, many university students suddenly found themselves cut off from almost all forms of face-to-face social activities from on-campus classes to part-time jobs because of campus lockdowns and social distancing measures (Takahashi, 2021). That being said, at the same time, the time students are spending online has increased substantially because of prolonged staying-at-home and also because many universities in Japan have replaced face-to-face classes with online ones since April 2020 (Cohen & Barnetta, 2021).

This unexpected shift from physical to virtual social interactions raises the question of whether online social activities can compensate for the deprivation of face-to-face activities for the affected students in terms of getting social support to cope with the distress brought about by the pandemic. In addition, can synchronous online classes –one of the most common online activities for Japanese university students during the pandemic– provide a platform for them to gain social support?

2 Literature review and theoretical framework

2.1 Sense of coherence

This study uses sense of coherence (SoC) –a person's perceived manageability, meaningfulness, and comprehensibility of their environment– by Antonovsky (1987) as an indicator of one's mental resilience. Recent studies, e.g., Schäfer, et al. (2020) in Germany, Dodd, et al. (2021) in Australia, and Hirano, Aramaki, & Ota (2020) in Japan, have shown that SoC is positively related

to people's psychological health and well-being in the face of the COVID-19 pandemic. Thus, it is hypothesised that:

- H1: sense of coherence reduces the level of COVID-19 distress for university students.

2.2 Social capital and social activities

Prior studies conducted in Japan, e.g., Mato & Tsukasaki (2019) and Tsuno & Yamazaki (2019), show that social capital –one's networks of social relationship and support– is a main predetermining factor of SoC. In addition, taking into account that Japanese society is considered to be relatively 'rich' in social capital because of cultural and historical reasons (Inoguchi, 2000), it is assumed that:

- H2: social capital increases the level of sense of coherence for university students.

Moreover, considering the rapid changes in the students' face-to-face and online social activities during the pandemic, it is hypothesised that:

- H3: decrease in face-to-face social activities during the COVID-19 pandemic has reduced the level of social capital for university students.

Last, the outbreak of COVID-19 in March 2020 in Japan, many universities, especially those in large cities, have switched from face-to-face to online classes to prevent the spreading of the virus (Kyodo News, 2020). Therefore, it is also hypothesised that:

- H4: increase in online social activities during the COVID-19 pandemic has increased the level of social capital for university students.

2.3 Synchronise online class

Although many universities were forced to switch to online during the pandemic, they could offer synchronise online classes to most students across the country owing to ICT advancements such as video conferencing applications (e.g., Zoom, Google Meet) and the proliferation of broadband Internet.

Different from traditional asynchronous online classes (e.g., on-demand), in a synchronous online class, students can interact with classmates and instructors in real-time over video communication, share text, audio, video, graphic data, and participate in group activities. Some scholars, e.g., Kansal, et al. (2021) predict that synchronous online classes will bring a paradigm shift in education.

Emerging studies, e.g., Sugino (2021) in Japan and Lin & Gao (2020) in China, conducted during the COVID-19 pandemic have found evidence that synchronous online classes could stimulate active interactions among students, and help them develop a stronger feeling of connection and mutuality with the classmates and instructors. Therefore, it is assumed that

- H5: Synchronous online class increases the level of social capital for university students.

That said, even if students can develop connections in synchronous online classrooms, it is unknown whether these social ties can 'spill-over' to their daily online social activities. Therefore, it is asked:

- RQ1: Can synchronous online classes strengthen the positive effects online social activities have on social capital for university students?

Finally, age, school year, and whether a student is living alone are included as control variables. The overall theoretical framework is shown in Figure 1.

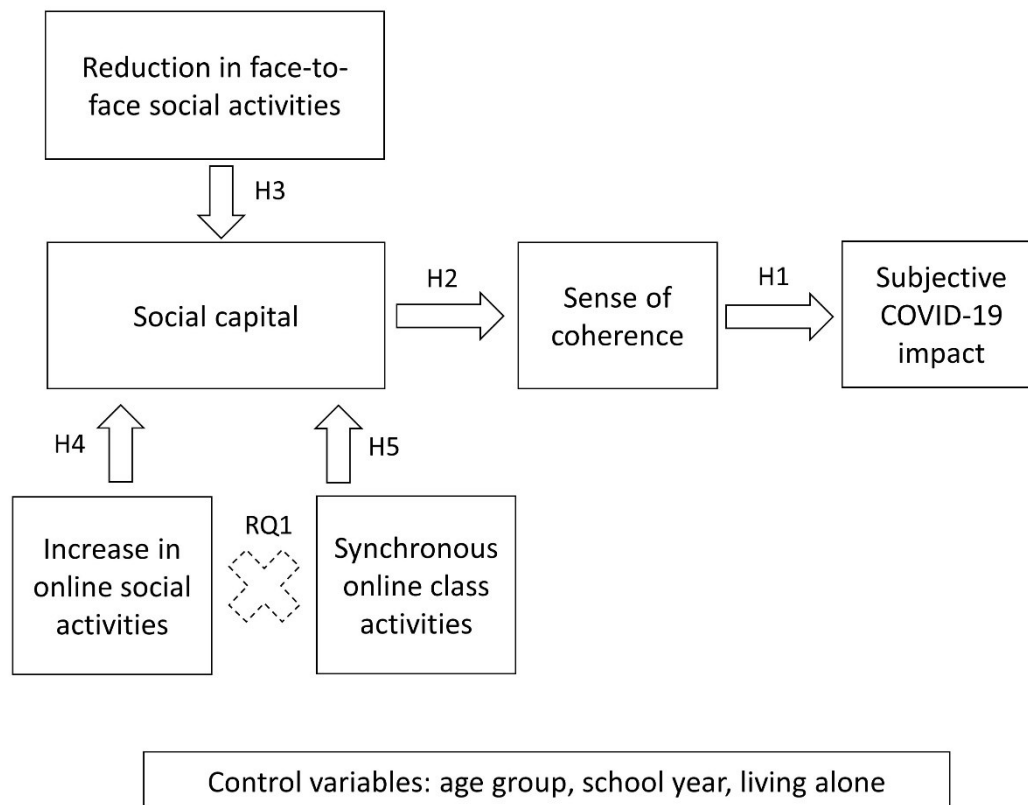


Figure 1 Theoretical framework

3 Data and method

This study uses non-random sampling focusing on a homogenous group. Specifically, because of resource and time limitations, samples were drawn from students in a women’s university in Japan, which has been offering online classes (both synchronous and asynchronous) since April 2020.

Data were collected using an online questionnaire survey conducted between Jan and Feb 2021, at the end of the first ‘fully online’ academic year. The questionnaire was emailed to 327 students. In the email, it was stated that the survey was fully voluntary, no personality identifiable information will be collected, and students can opt out at any time. Students were also offered to enter a lottery to win a 500 Japanese yen coupon. In total, 203 valid responses were received (62% response rate).

The samples cover all school years (13% freshman, 38% sophomore, 26% junior, 18% senior, 5% graduate students). The median age group was 20-21 years old. 93% of the students reported that they have no face-to-face class at all since April 2020. 92% and 25% reported that more

than half of all their classes were synchronous and asynchronous online classes, respectively. It is also worth noting that 18% of the students reported that they had frequently experienced Internet connection problems during their synchronous online classes, and 10% reported that they frequently had difficulties finding a suitable/quiet location to take their synchronous online classes.

3.1 Sense of coherence

SoC was operationalised by the Japanese version of Antonovsky's SoC-13 scale (Togari & Yamazaki, 2005; Togari, et. al., 2008), which is commonly used in prior studies of sense of coherence studies. For example, using this scale, studies conducted in Japan, e.g., Kimura, et al. (2001), Sakamoto & Yajima (2005) and Haga, et. al., (2017), find that SoC is directly and positively related to university students' mental well-being and ability to deal with distress. The scale consists of 13 questions (5 on one's perceived comprehensibility, 4 on manageability, and 4 on meaningfulness). In this study, the questions were rephrased to focus on the COVID-19 pandemic. For example, the respondents were asked, on a 4 point Likert scale (1=strongly agree to 4=strongly disagree), during the COVID-19 pandemic: 'have you felt very confused? (comprehensibility),' 'do you think you have been treated unfairly? (manageability),' and 'have you felt that you don't care about anything anymore? (meaningfulness)' etc.

The total SoC score, normalised to 100pt, was 47.79, which was similar to previous studies on Japanese university students, e.g., Mato & Tsukasaki (2019) (48.05¹) and Endo, et. al. (2013) (50.69 for males and 47.53 for females²). In internal reliability check, also similar to Mato & Tsukasaki (2019) and Endo, et. al. (2013), the I-T correlations of 3 questions (Q1, Q12, and Q13) were below 0.3. According to the said authors, this might be due to culturally different interpretations of the questions. Thus, the three questions were removed and the Cronbach's alpha was improved from 0.744 (13 items) to 0.787 (10 items). The remaining 10 variables were then aggregated to form the overall SoC (m=2.40, SD=0.84).

3.2 COVID-19 distress

Covid-19 distress was represented by the students' subjective impacts caused by the pandemic. It was operationalised by asking the respondents, on a 4-point Likert scale (1 not at all to 4 very much), how much they think COVID-19 has negatively affected their 1-study, 2-finance, 3-health, 4-job searching, 5-mood, 6-relation with friends, and 7-relation with family. Among the 7 factors, the highest was 'mood' (m=3.55, SD=0.84), followed by 'job searching' (m=3.23, SD=1.03) and 'study' (m=3.01, SD=0.93) indicating that the pandemic did cause strong psychological distress to the students. The I-T correlations of all 7 factors were greater than 0.3 and their Cronbach's alpha was 0.706. The 7 factors were aggregated to form the overall perceived COVID-19 impact (m=2.86, SD=0.59).

3.3 Social capital

Social capital was operationalised using the Subjective Social Capital Scale for University Life (SSCS-U) developed by Haga, Keisuke, & Sakamoto (2015), which is found to be a reliable predictor of psychological well-being of Japanese university students. The scale comprises 11

¹ Normalised to 100pt. 50.48 in its original 7 point scale (13=lowest, 91=highest).

² Normalised to 100pt. 52.54/50.07 (male/female) in their original 7 point scale (13=lowest, 91=highest).

questions on how students perceived their social relations with their teachers, classmates, and friends.

In this study, the questions were modified to focus on the pandemic. For example, the respondents were asked, on a 4 point Likert scale (1=strongly disagree to 4=strongly agree), during this pandemic do you think: 'people are generally trustworthy,' 'people are generally good' etc. Similar to prior studies, the 11 items have high internal reliability (Cronbach's alpha = 0.826) and thus, were aggregated into a single variable (m=2.95, SD=0.49).

3.4 Face-to-face social activities

Reduction in face-to-face social activities was operationalised by asking the respondents how much their face-to-face activities (1- classes, 2- circle/club activities, 3- social events, 4- part-time jobs) have reduced since the beginning of the pandemic on a 4 point Likert scale (1=no change to 4=reduced to almost none).

Among the 5 types of face-to-face activities, classes were the most severely impacted as 95% of the respondents reported that their face-to-face classes were reduced to almost none (m=3.91, SD=0.42). It was followed by social events (m=3.68, SD=0.77) and circle/club activities (m=3.28, SD=1.15). The Cronbach's alpha of the 4 activities was 0.385 indicating that they do not reliability form into a single factor. Therefore, the 4 activities were represented independently in the path model.

3.5 Online social activities

Increase in online social activities was represented by asking the students, on a 4 point Likert scale (1=no change to 4= doubled or more), how much their online social activities have increased since the beginning of the pandemic including: 1- talking with friends/classmates about study/homework (m=2.67, SD=1.09), 2- joining online circle/club activities (m=2.15, SD=1.17), 3- chatting with friends (m=2.37, SD=1.07). I-T correlations of the 3 factors were greater and 0.3 and their Cronbach's alpha was 0.616. They were aggregated into a single factor (m=2.40, SD=0.84).

3.6 Synchronous online class

Synchronous online class was represented by the interactive activities students have in their synchronous online classroom. It was operationalised by asking the students how frequently they had the following 4 types of activities in their synchronous online classes since the beginning of the pandemic on a 4 point Likert scale (1=none to 4=4-5 times per week): 1- discussion with instructors (m=2.10, SD=0.84), 2- class discussion/activity (m=2.21, SD=0.93), 3- group discussion/activity (m=2.89, SD=0.86), 4- pair discussion/activity (m=2.47, SD=0.99). The I-T correlations of the 4 factors were greater and 0.3 and their Cronbach's alpha was 0.718. They were aggregated into a single factor (m=2.42, SD=0.67).

4 Results

The hypotheses were examined using path analysis with IBM SPSS and AMOS 27. A path model was constructed to represent the theoretical model shown in Figure 1.

The model fit (path 16) indices³ were satisfactory according to the criteria recommended by (Hair, Black, Babin, & Anderson, 2014). The results of H1-H5 are summarised in table 1. Next, RQ1 was examined by testing the interaction effect (product) of online social activities and synchronous online classes on social capital. The result was insignificant. In other words, synchronous online classes do not alter the positive effect online social activities have on social capital and vice versa.

Table 1 - H1 to H5 results

Hypothesis				Standardised β coefficient	Result
H1	Sense of coherence	Reduces	COVID-19 impact	-0.473***	Supported
H2	Social capital	Increases	Sense of coherence	0.139**	Supported
H3	Decrease in face-to-face social activities	Reduces	Social capital		Partially supported
H3-1	classes			NS	
H3-2	circle/club activities			NS	
H3-3	social events			-0.152**	
H3-4	part-time jobs			-0.118*	
H4	Online social activities	Increases	Social capital	0.151**	Supported
H5	Synchronous online classes	Increase	Social capital	0.144**	Supported

***<0.01; **<0.05; *<0.1; NS Not Significant

5 Discussion and conclusion

The results have shown that first, in line with prior studies, by reducing the level of perceived COVID-19 impact, sense of coherence helps the students to deal with COVID-19 distress. Second, also consistent with prior studies, social capital, in particular the students' subjective social capital is a main antecedent of their level of sense of coherence.

Third, H3 reveals that the reduction in face-to-face social activities indeed has negative effects on the students' mental well-being in the pandemic as it reduces their subjective social capital and subsequently, their level of sense of coherence. Specifically, it is found that reductions in face-to-face social events and part-time jobs have significantly reduced the students' level of subjective social capital.

Fourth, on the other hand, the results have also shown that the increase in online social activities as well as activities in synchronise online classes can compensate for the negative effect the reduction in face-to-face social activities has on the student's subjective social capital. That said,

³ CMIN=74.41, DF=41, GFI=0.944, CFI=0.918, RMSEA=0.064, PCLOSE=0.160, SRMR=0.0798

in response to RQ1, synchronise online classes do not interact with the students' online social activities.

In sum, the results have shown that although the interactive activities offered by synchronise online classes can help students to deal with COVID-19 distress by enhancing their subjective social capital and sense of coherence, the positive effect appears to stay only within the classroom. Considering that a noticeable number of students reported that they have frequently encountered Internet and environmental problems when taking synchronise online classes, to help students to cope with the distress caused by COVID-19 more attention should be paid to provide them with a suitable environment to attend their online classes. Furthermore, educators can also design class activities beyond the synchronous online classroom.

Lastly, a main limitation of this study is its homogenous sample group that samples were all drawn only from one university because of time and resource limitations. Nonetheless, the results have shown that the framework is in line with prior studies and thus, it can be applied for future studies with a wider sample population group.

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