

The Implicit Self-Esteem of Japanese Junior High School Students under the COVID-19 Pandemic

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Abstract

We aimed to examine the psychological effects of the COVID-19 turmoil of junior high school students. We assessed 142 Japanese junior high school students (74 boys, 68 girls) who experienced the confusion caused by the COVID-19 pandemic in 2020 and compared them with those of 164 students (81 boys, 83 girls) before the turmoil in 2018. We administered the paper-and-pencil Implicit Association Test (Mori, Uchida, & Imada, 2008) to assess implicit self-esteem with the target word “myself” to both cohorts. We classified them into positive, neutral, and negative self-esteem groups based on their implicit association scores. Contrary to the fear of adverse effects, the results showed that students’ implicit self-esteem scores maintained the same level even under the COVID-19 turmoil in 2020. Thus, the present study showed a silver lining of Japanese junior high school students whose self-esteem were maintained under the unordinary school life.

Keywords

COVID-19, Implicit Self-Esteem, Junior High School Students, Paper-and-Pencil IAT, Pre- and Post-Test Design with Similar Cohorts

1. Introduction

COVID-19 has prevented many children worldwide from learning at school. In Japan, the school year rounded up early, and schools were temporarily closed from the beginning of March 2020. Schools resumed in early April for the new school year, but a national emergency was declared on April 16, and school was closed again until the end of May. Children could not leave their homes for a long time then and were forced to endure unusual life conditions at home.

Amid the global crisis caused by the COVID-19 pandemic, there has been considerable research (e.g., [Ozarkan & Dogan, 2020](#)) on educational methods of learning at home (online classes, e-learning, and digital content). Other educational researchers in different countries have reported a variety of teaching activities utilizing digital devices for online education during the COVID-19 pandemic (e.g., [Dai & Xia, 2020](#); [Ge, Smyth, Searle, Kirkpatrick, Evans, Elder, & Brown, 2021](#); [Guo, Huang, Lou, & Chen, 2020](#); [Ichsan, Rahmayanti, Purwanto, Sigit, & Rahman, 2020](#); [Khlaif, Salha, Fareed, & Rashed, 2021](#); [Schaefer, Abrams, Kurpis, Abrams, & Abrams, 2020](#); [Vourloumis, 2021](#); [Yao, Rao, Jiang, & Xiong, 2020](#)).

But how has the turmoil caused by COVID-19 affected school children psychologically? In comparison with the amount of research into teaching methods described above, not many studies have examined these psychological effects yet. [Fulya, Aykut, and Erdal \(2021\)](#) studied adolescents' levels of depression and anxiety and coping strategies among 3058 students (978 males and 2080 females) from 6th to 12th grade in Turkey. The results showed that the percentages of adolescents with high depression, anxiety, and depression and anxiety were 45.6%, 48.6%, and 47.1%, respectively. Higher levels of anxiety and depression were found among females, high school students, those with less-educated parents, those with separated parents, those who used social media often, and those with three or more siblings. The researchers also found that students with high anxiety and depression used more avoidant and antagonistic coping strategies.

A thorough search in the ERIC and Google Scholar databases found only one study that investigated the psychological effects of the COVID-19 pandemic on middle school students; the study was conducted by [Fulya et al. \(2021\)](#). To examine the psychological effects of COVID-19, researchers should compare students' mental states during/after the COVID-19 turmoil with those before the turmoil. Since no one had expected the COVID-19 confusion, it was difficult to conduct comparative research to examine the changes in children before and after the pandemic. Moreover, even before COVID-19, there were very few psychological studies concerning Japanese children in elementary schools and junior high schools ([Uchida & Mori, 2004](#); [Uchida, 2020](#)).

In 2018, before the COVID-19 outbreak, [Uchida and Mori \(2020\)](#) investigated Japanese junior high school students suspected of misreporting their self-esteem and showing it to be lower than reality on questionnaires. The low self-esteem of Japanese children drew the attention of both domestic and international researchers. For example, a recent survey showed that Japanese youth (13 - 29 years) had lower self-esteem than those in other countries despite their high achievements in most international scholastic assessments, such as PISA ([Schleicher, 2019](#)) and TIMSS ([Matsuura & Nakamura, 2021](#)). In addition, the Japanese governmental survey ([Japanese Government Cabinet Office, 2019](#)) reported that the proportion of Japanese students who agreed to the statement "I have my unique strengths" was 62.3%, while the proportion was 91.4% in Germany, 91.2% in the USA, and 90.6% in France.

Uchida and Mori (2020) questioned the students' responses to the questionnaire and suspected that they might be distorted with social desirability. Then they utilized a paper-and-pencil version of the IAT (Mori, Uchida, & Imada, 2008) to measure the implicit self-esteem of Japanese students, along with a conventional questionnaire. The administration of a battery of implicit and explicit self-esteem assessments supported their hypothesis that Japanese students hid their self-esteem. Japanese students answered negatively on questionnaires but performed positively on the implicit measure.

The Uchida and Mori (2020) study was the catalyst for this one. Since we had data on the self-esteem of Japanese junior high school students before COVID-19, we wanted to assess the tumultuous effects COVID-19 had on them by comparing it with later data. We also wanted to investigate how students' self-esteem had changed after the confusion COVID-19 caused in their school life.

Therefore, we conducted the same self-esteem assessment procedure as Uchida and Mori (2020) with a new cohort of students in 2020, when Japan was affected by the COVID-19 pandemic. As for the explicit self-esteem assessment, Uchida and Mori (2020) used data from the annual survey conducted throughout public junior high schools in Nagano City in 2018. Unfortunately, the COVID-19 prevention measures meant that the annual survey was canceled in 2020; however, we were able to administer the same paper-and-pencil IAT to assess the implicit self-esteem of students in 2020. Although self-esteem is more stable than other personality traits (Trzesniewski, Donnellan, & Robins, 2003), the extra-ordinary school life may have left a shadow on students' self-esteem. Here, we report these two assessments as an integrated study.

In sum, we aimed to investigate how students' self-esteem had changed after the confusion COVID-19 caused in their school life by comparing two cohorts of Japanese students before and during the COVID-19 pandemic. The two cohorts were different but similar enough to serve the research purpose.

2. Method

2.1. Assessment Design

The present study was a pre- and post-test assessment design with two different samples for each test. Although the standard pre- and post-test design uses the same sample for both assessments, it was almost impossible to survey with an appropriate procedure during the COVID-19 turmoil.

Therefore, we assessed the implicit self-esteem of two different but similar cohorts of Japanese 7th-graders before and during the COVID-19 pandemic. The crucial reason why we chose 7th-graders was that it was the first academic grade at junior high school in the Japanese school system. We had recorded data in 2018 before the COVID-19 turmoil began, and we took another sample in 2020. We refer to these as the 2018 pre-COVID cohort and the 2020 under-COVID cohort. For both cohorts, we introduced another between-participant variable: gender.

2.2. Participants

The 2018 pre-COVID cohort (Uchida & Mori, 2020) consisted of 164 7th-graders (81 boys and 83 girls). The 2020 under-COVID cohort consisted of 142 7th-graders (74 boys and 68 girls). The cohorts came from two adjacent municipal junior high schools in Nagano City, the prefectural capital of Nagano Prefecture, located about 200 kilometers north of Tokyo. These schools were similar regarding classes, students, teachers, students' scholastic levels, and their families' socio-economic statuses. In addition, all the students were Japanese. It would be desirable to conduct a power analysis before we decided the sample sizes. However, since we had already administered the assessment of the 2018 pre-COVID cohort for a different purpose. Then, we used another cohort with a similar sample size without conducting the power analysis.

2.3. Implicit Assessment of Self-Esteem by Paper-and-Pencil IAT

As Uchida and Mori (2020), we define in the present study, "implicit self-esteem" as equivalent to the implicit associative value of the target word "myself (自分)" assessed with a paper-and-pencil version of the IAT. Mori et al. (2008) developed a paper-and-pencil version of the IAT, adopting the implicit association mechanism used for the IAT (Greenwald, McGhee, & Schwartz, 1998). The newly devised test consists of a series of word evaluation tasks and the target words to be assessed for the implicit associative value. In the A3-sized test sheet, words with positive or negative meanings are printed randomly on lines. The fundamental task is to classify each word as "good" or "bad" by marking it with a circle or a cross, respectively, which is standard marking procedure in Japan. This should take 20 seconds for each line. Among the evaluation words, the target concepts (e.g., "myself") are randomly interspersed and placed every two other words. The examinees are instructed to mark the target words with a circle on even lines (the positive task) and a cross on odd lines (the negative task). The rationale of the test is that if an examinee has a positive implicit attitude toward the target, it is easier to mark it with a circle rather than with a cross and vice versa. Accordingly, the examinee would perform the positive task more quickly than the negative task. Thus, the difference in performance between the positive and negative tasks indicates the examinee's implicit attitude toward the target.

For the present study, we prepared a 15-line paper-and-pencil IAT test sheet that assesses three different target words: "school (学校)," "friends (友達)," and "myself." The first line was practice without any target word. Then, the following lines, 2nd - 13th, contained the three target words with four lines each. Finally, the two remaining lines were used to exemplify how the tasks would progress.

2.4. Procedure

One of the authors, a junior high mathematics teacher, administered the paper-and-pencil IAT, allocating about 10 minutes for this test during his class time. The teacher conducted the activity as follows:

1) Following the standard informed-and-consent procedure, the experimenter handed out the test sheet to the students.

2) He gave the general instructions: “Evaluate the meaning of each word as quickly as possible by marking with either a circle or a cross. Perform line by line with the start cue and stop at the stop signal. Finally, in relation to the target words, mark them with either a circle or a cross, irrespective of the meaning as instructed for each line.”

3) He began the marking task procedure from the first to the last (13th) lines, measuring 20 seconds for each line.

3. Results

3.1. Preliminary Analyses

First, we counted the total words marked in 40 seconds (2×20 seconds) for the positive and negative tasks separately for each target word. Then, the implicit indices, the Implicit Association Quotients (IAQ₁₀₀), were calculated with the formula:

$$IAQ_{100} = 100 \times (WP - WN) / (WP + WN)$$

WP = the total number of words marked for the positive tasks.

WN = the total number of words marked for the negative tasks.

The IAQ₁₀₀ index represents the difference in the number of words marked under the two conditions per 100 words. A positive/negative IAQ₁₀₀ denotes a positive/negative implicit attitude toward the target concept.

The averages of IAQ₁₀₀ were 7.57 ($SD = 10.91$) for the 2018 cohort and 9.02 ($SD = 9.93$) for the 2020 sample. Following the previous studies (Uchida & Mori, 2018), we discarded the data exceeding the average $\pm SD \times 1.96$, participant-wise, as outliers. As a result, we used the data from 156 of the 2018 students (79 boys, 77 girls) and 135 of the 2020 students (71 boys, 64 girls) for the following analyses.

3.2. Comparisons of the Means: ANOVA

Table 1 shows the average IAQ₁₀₀, excluding outliers. Contrary to the fear of COVID-19’s negative effects, the 2020 cohort showed even higher IAQ scores. However, a 2 (year: 2018 vs. 2020) \times 2 (gender: boys vs. girls) ANOVA (analysis of variance) revealed that neither main effects nor interactions were significant: $F_s < 0.93$, $p_s > 0.34$.

Table 1. Average IAQ₁₀₀ scores of the target word “myself”.

		N	Average	SD
2018	Boys	79	8.90	9.09
	Girls	77	7.46	9.28
	Total	156	8.19	9.18
2020	Boys	71	9.34	8.48
	Girls	64	9.13	7.40
	Total	135	9.24	7.96

3.3. Comparisons of the Number of Students with Negative IAQ Scores

The standard ANOVA showed no significant differences because the IAQ scores were not normally distributed. Therefore, we used a nonparametric approach, as did the previous studies (Uchida & Mori, 2018), by classifying the examinees into three groups according to their IAQ_{100} : positive group with $IAQ_{100} \geq 2.00$, negative group with $IAQ_{100} \leq -2.00$, and neutral group with IAQ_{100} in the intermediate range ($-2.00 < IAQ_{100} < 2.00$).

Table 2 shows the number of students classified into the three groups for the two cohorts. We obtained results showing that most of the students had positive implicit self-esteem, which was consistent with previous research on the self-esteem of junior high school students (Eccles, Wigfield, Flanagan, Miller, Reuman, & Yee, 1989; Wigfield, Eccles, Mac Iver, Reuman, & Midgley, 1991). The results also revealed no negative effects of COVID-19 again. Fewer students were in the negative groups in the 2020 cohort than in the 2018 cohort. However, this was not statistically significant ($X^2_{(6)} = 11.717, 0.05 < p < 0.10$).

3.4. Analyses of the IAQ Scores of “School” and “Friends”

We assessed the implicit attitudes toward “school” and “friends” along with “myself” in the present study. We briefly described the findings from the additional assessment here. **Table 3** shows the number of students classified into the three groups based on the IAQ scores of “school” (top) and “friends” (bottom).

Table 2. Number of students in negative, neutral, and positive groups for the target of “Myself”.

“Myself”		Negative	Neutral	Positive	Total
2018	Boys	9	14	56	79
	Girls	12	9	56	77
2020	Boys	4	13	54	71
	Girls	5	3	56	64

Table 3. Number of students in negative, neutral, and positive groups for the targets of “School” and “Friends”.

“School”		Negative	Neutral	Positive	Total
2018	Boys	10	16	54	80
	Girls	18	12	46	76
2020	Boys	7	9	53	69
	Girls	11	5	50	66
“Friends”		Negative	Neutral	Positive	Total
2018	Boys	6	4	67	77
	Girls	5	7	63	75
2020	Boys	0	12	58	70
	Girls	2	4	57	63

For both target words, we obtained the same tendencies as for the target word “myself.” First, most of the students showed positive IAQ scores for “school” and “friends.” Second, COVID-19 had no adverse effect on the scores. There were fewer students with negative IAQ scores in the 2020 cohort. However, the differences did not reach the statistical significance for “school,” $X^2_{(6)} = 10.844$, $0.05 < p < 0.10$. As for the target word “friends,” we combined the negative and neutral groups for a X^2 test and obtained no statistical differences ($X^2_{(3)} = 1.933$, ns).

4. Discussion

Researchers working at universities worldwide have reported on the psychological impacts of lockdowns and other measures against COVID19 on university students (Commodari & La Rosa, 2020; Commodari, La Rosa, & Coniglio, 2020; Commodari, La Rosa, Carnemolla, & Parisi, 2021; Wang & Zhao, 2020), including Japan (Nishimura, Ochi, Tokumasu, Obika, Hagiya, Kataoka, & Otsuka, 2021; Yamamoto, Uchiumi, Suzuki, Yoshimoto, & Murillo-Rodriguez, 2020). However, there are significant differences from this study’s Japanese elementary and junior high school students in at least the following two respects, making direct comparisons almost meaningless. First, unlike in other countries, no legally binding measures such as lockdowns were implemented in Japan. Second, while online classes and other forms of education were continued for university students in Japan, elementary and junior high school students suddenly found themselves in a situation where schools were closed. In addition, they were provided little or no schooling for several months because there were no facilities for online classes either in schools or children’s families in Japan.

In the first place, the academic impact itself, which is more important than the psychological impact, has not been assessed for elementary and junior high school students in Japan. Since a nationwide academic achievement survey is conducted every year in Japan, it should have been easy to find out how COVID-19 affected children’s academic performance by comparing the results of the pre- and post-COVID-19 years. Unfortunately, however, the 2020 surveys were canceled. Moreover, in 2020, the standard term examinations were not administered in junior high schools in Nagano, where the present study was conducted.

In this sense, the results of this study are valuable, even though it was a survey on the limited psychological aspect of self-esteem at a junior high school in the region where the authors work. We took full advantage of the simplicity of administration of the paper-and-pencil IAT. As described in 2.4 Procedure, it took less than 10 minutes to administer at class, including the distribution and collection procedures. It needed another 10 minutes to prepare the target word and print the test sheets.

4.1. Did the COVID-19 Pandemic Affect Students’ Implicit Self-Esteem?

The 2020 cohort of the present assessment study graduated from elementary school earlier than usual (at the beginning of March) without a graduation cer-

emony. They started junior high school activities during the turmoil caused by COVID-19. Consequently, they experienced a much longer spring break. During these extraordinary school closures, public junior high schools in Nagano City did not offer online classes. Students had to learn on their own and do a lot of homework. Being deprived of school life because of such abnormal circumstances might have harmed the children.

However, the two assessments of implicit self-esteem, the one before and the one during the COVID-19 pandemic, revealed that the irregularity of the students' school education had few adverse effects on their self-esteem. The IAQ scores for the target word "myself" from the 2020 cohort were higher than those assessed in 2018. The IAQ scores of the other two education-related words, "school" and "friends," showed similar tendencies. Therefore, contrary to the fear that the COVID-19 preventive measures would have harmful side effects on students' psychological health, children seem to have been doing well during the school closures.

4.2. Why Did School Closures Have Little Effect on Students' Self-Esteem?

The under-COVID cohort experienced an exceptionally long and irregular spring break never experienced before. [Kuhfeld, Soland, Tarasawa, Johnson, Ruzek, and Liu \(2020\)](#) estimated how school closures due to COVID-19 would affect students' learning. In turn, stagnated learning would affect the students' self-esteem. So then, why did their self-esteem remain the same or become higher than that of the 2018 cohort?

At first glance, the reason seemed to be the long spring break the 2020 students experienced. However, this long spring break due to the COVID-19 disaster coincided with the transition period between elementary school graduation and the start of junior high school in Japan. Therefore, the spring break is generally longer for 6th/7th-transitional graders. Also, although it was somewhat shorter, the 2018 pre-COVID cohort also experienced a long spring break in 2018. Usually, no homework is assigned during the transition period in spring. Therefore, the situations did not differ between the two cohorts.

The transition period is a special occasion for the 6th/7th-transitional graders, who graduate from elementary schools and move to junior high schools. Both elementary and junior high schools are compulsory in Japan, but they are considerably different in many aspects. The students experience a series of unforgettable events during the transition phase, just like being tossed among big waves. These waves might have diminished the effect of the COVID-19 pandemic. Please note that the COVID-19 virus was not a threat to children in 2020. Most COVID-19 pandemic effects were indirect and not severe for children, such as school closures and mandatory homestays. It seemed children were less affected by the disease than adults.

[Kuhfeld et al. \(2020\)](#) predicted that deprivation of learning opportunities would have considerable adverse effects on students' learning. However, the

school closure experienced by the 2020 cohort was different from long absenteeism. Students absent from school for a long time will fall behind their classmates in school achievements and may find their self-esteem degraded. Meanwhile, the school closures may not have allowed students to fall behind because they are altogether deprived of learning opportunities. Then, it seemed reasonable that the students in the 2020 cohort kept their self-esteem.

4.3. Limitations and Further Research Perspectives

Yamaguchi et al. (2007) compared self-esteem among Japanese, American, and Chinese university students via a conventional questionnaire and the implicit association test. The results showed that Japanese university students had lower self-esteem in the questionnaire (i.e., lower explicit self-esteem) than students from other countries in the questionnaire, but there were no differences in their implicit self-esteem. Uchida and Mori (2020) found the same tendency with Japanese junior high school students; they showed lower self-esteem in the explicit measure than in the implicit assessment. Unfortunately, however, we could not obtain the explicit self-esteem data for the 2020 under-COVID-19 cohort, so we could not examine the possible effect of the COVID-19 pandemic on the conventional self-esteem scores.

As of September 2021, the COVID-19 pandemic still affects people's way of living in Japan, and children continue to receive irregular schooling. We need to continue our psychological assessment of how these unusual circumstances are affecting the children. Even if this one-off study revealed little impact, longitudinal studies might reveal long-term effects. Therefore, it is necessary to continue measuring the possible influences with the implicit indices used in this study and the conventional explicit measures such as questionnaires and interviews.

4.4. Implications for Practice

Implications for educational practitioners from this study are the following two points. First, the disruption to schooling caused by the COVID pandemic may be lighter than feared. Children are resilient and adaptable under any circumstances, as long as their physical health is protected. Rather than worrying too much, we should focus on implementing the best education possible in the current situation. Another point is that we should assess the psychological aspects of children not only by using traditional methods such as questionnaires and interviews but also by using the implicit measures used in this study. As Yamaguchi et al. (2007) and Uchida and Mori (2018, 2020) revealed, conventional explicit indicators alone may not reflect the actual situation. The paper-and-pencil IAT can be administered in schools as handy and efficiently as a questionnaire. We would recommend using it along with the questionnaire survey.

5. Conclusion

During the global COVID-19 crisis, few psychological studies focused on junior

high school students, which was not surprising because few psychological studies were conducted on this population in general. This research was challenging under the current situation. We used the paper-and-pencil version of the Implicit Association Test to measure the implicit self-esteem of first-year students in junior high school who just started their school life after school resumed. In general, we found no effects of the COVID-19 turmoil on students' implicit self-esteem: the 2020 under-COVID-19 cohort showed even higher implicit self-esteem than the 2018 cohort. Thus, during the COVID-19 crisis, Japanese junior high school students experienced difficulties but maintained high self-esteem, contrary to the fears. In conclusion, we do not have to worry much about the psychological effects of the COVID-19 turmoil on school education. The present study showed a silver lining of Japanese junior high school students whose self-esteem were maintained under the extra-ordinary school life.

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Data Availability Statement

The original data are available at the following site:

https://researchmap.jp/multidatabases/multidatabase_contents/download/230813/9ceb2e156dfb66626a2068e497dc9791/21552?col_no=2&frame_id=575977.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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