Construct validity of Antonovsky’s sense of coherence scale: Stability of factor structure and predictive validity with regard to the well-being of Japanese undergraduate students from two-year follow-up data

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This study, which conducts a research on the well-being of Japanese undergraduate students, has three aims. First, this study examines whether the Japanese version of the 13-item sense of coherence (SOC) scale (SOC13) and 11-item SOC scale (SOC11) possess the stability of factor structure. Second, it tries to establish the comprehensive undergraduates’ well-being model that is predicted by SOC. Last, it examined whether the Japanese version of SOC13 and SOC11 predict established undergraduates’ well-being in addition to examining stability of factor structure and level and changes of their SOC, and which scale is more useful in Japan, SOC11 or SOC13.

To investigate these objectives, a follow-up survey was conducted based on a self-administered questionnaire that was given to 406 undergraduates at two universities in Tokyo. The first surveys were conducted on first and second year undergraduates in May and October 2000 (Time1) and second survey were September 2002 (Time2); valid responses were received from 281 students (valid response rate: 69.2%).

Structural equation modeling revealed that SOC13 and SOC11 had a high stability of second-order factor structure, though there remained a need for minimal modifications. In addition, an undergraduate’s well-being model, which was controlled for gender, grade, and school, had a good model fit. In both SOC13 and SOC11, the SOC-level and SOC-change had a common, significant effect on the physical-mental well-being and psychosocial well-being of the subjects. However, common to both sides, the path coefficients from SOC-level and SOC-change, particularly SOC-level, to the psychosocial well-being were lower in comparison to physical-mental well-being though this model was modified in fractional part.

SOC11 and SOC13 possessed nearly the same stability and influence in the physical-mental well-being and psychosocial well-being. We can assume that it is permissible to use the SOC13 or SOC11 and reserve judgment on SOC13 or SOC11. It will be necessary to compare the construct validity of SOC13 with that of SOC11 in other samples.

Key words: sense of coherence, factor structure, predictive validity, follow-up survey, undergraduates, well-being

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I Introduction

Sense of Coherence (SOC) forms the core of the salutogenesis theory; it is an important factor in the strength to survive, ability to cope with stress, and salutogenic strength (Antonovsky, 1987). The salutogenesis theory, which focuses on salutary factors, is held as a basic theory in WHO Health Promotion (Kickbush, 1996). Moreover, SOC is conceptualized within the core of these salutary factors. It fosters the ability of an individual or group to successfully cope with stressors and life crises. Acquired through positive environments or group to successfully cope with stressors and life factors. It fosters the ability of an individual or

The stability of SOC has also been established as to which scale has a better structure, SOC13 or SOC11.

Predictive validity, particularly regarding the health status of SOC scales, has been examined. Eriksson and Lindstrom (2006) reviewed this considerably. In SOC29, SOC predicted the occurrence of coronary artery disease in workers after eight years (Poppius et al., 1999), all cause mortality after eight years (Poppius et al., 2003), Lancashire QOL Profile and global psychosocial functioning in patients with schizophrenia after eighteen months (Bengtsson-Tops and Hansson, 2001), and suicidal ideation and attempts suicide after six months (Petrie and Brook, 1992). SOC13 predicted physical symptom and burnout in workers after a year (Feldt et al., 2000). The 6-item SOC predicted sickness absence in female workers after four years (Kivimäki et al., 2000) and sickness absence and self-rated health (SRH) in female workers after four years (Kivimäki et al. 2002). In the 16-item version, the Finnish public health
researcher’s group was shown that SOC predicted SRH in the Finnish representative sample after four years (Suominen et al., 2001) and the occurrence of disability in a Finnish representative sample after seven years (Suominen et al., 2005). The 3–item SOC given by Lundberg and Nystrom (1995) predicted all cause and cardiovascular disease mortality in the residents of Norfolk region in England (Surtees et al., 2003), and the same research group were shown about prediction cancer mortality by a 3–item SOC.

However, the abovementioned studies about the predictions of SOC did not take into account the stability of the factor structure of SOC measurement. Although it was not proved, Kivimäki et al. (2000) examined whether SOC13 predicted psychological complains and physical symptoms using the stability of factor structure of the model of SOC13 and the cross–lagged model by structural equation modeling. Veenstra et al. (2005) proved that SOC13 predicted bodily pain and social functioning in Norwegian patients with a chronic illness after two years by the same structural equation model.

Although studies have not yet revealed whether or not SOC can predict subsequent health or well–being of subjects in their adolescence by interpreting Antonovsky’s SOC theory (Antonovsky, 1987), SOC can predict well–being as regards a successful response to the developmental theme. In this study, in order to determine whether SOC can predict the future health or well–being, including health, of college students, we have first defined the concept of well–being as physical or mental well–being, which included the ability to successfully cope with developmental tasks.

According to Antonovsky, SOC occurs in a formal period and is unstable until the individual is approximately in his or her thirties. The subjects of this study are students who belong to this age group. Therefore, taking into account both the SOC levels at the baseline time and the subsequent changes in SOC, it is necessary to consider the influence of SOC on future well–being.

Given the above, this study pertaining to undergraduate students has these aims: to examine the stability of the factor structure of the Japanese versions of SOC13 and SOC11; to establish the comprehensive undergraduate’s well–being model that is predicted by SOC; and to examine whether the Japanese version of SOC13 and SOC11, predict established undergraduates’ well–being in addition to examining stability of factor structure and level and changes of their SOC, and which scale is useful in Japan, SOC11 or SOC13.

II Method

1. Subjects and method (Fig. 1)

The research was conducted on undergraduate students attending two universities in Tokyo during three classes in May and October 2000 (Time 1). From among the 569 students who had participated, 406 agreed to participate in the follow–up survey after two years, which was conducted in 2002 on the students (264 from University “A” and
142 from University “B”) who were in their third and fourth years at the time. For the target subjects, the issue of career choice was a major concern after two years, and these students were considered to be capable of resolving self-fulfillment issues arising in school life. Based on the difficulty level of each school’s entrance examinations, University “A” was considered as a “top-tier” school, while University “B” was considered as a “middle-tier” school.

A follow-up survey was conducted by mailing questionnaires from early to mid-September 2002 (Time 2); an analysis was performed on the responses of 281 students (182 from University “A” and 99 from University “B”), with a valid response ratio of 69.2%. The frequency of participants in the baseline and follow-up surveys is presented in Table 1.

2. Measures
1) SOC scale (Time 1 and Time 2)

We used the Japanese version of Antonovsky’s SOC scale, created by Yamazaki (1999). The Japanese version of SOC is a 13-item seven-category scale. In this study, the first survey, which was conducted in 2000 (T1SOC), had a Cronbach α coefficient (hereafter denoted as α) of 76, while that of the second survey, conducted in 2002, (T2SOC) was 79.

2) Concepts related to the well-being of undergraduates (Time 2)

The concepts (1–5) given below were created for optimum hearings of undergraduates, graduate students, and adults: and targeted psychosocial well-being that considered social relationship and self-fulfillment in Konu’s school’s well-being (Konu and Rimpela, 2002), career thought as their developmental task (Havighurst, 1953), and health status as their physical-mental well-being. Health status was not only considered as somatic symptoms and catching a cold in Konu’s school well-being (Konu et al., 2002) and Quality of Life of university students (Raphael, 1996) but also as a tendency to stay indoors which revealed the growing tendency of the Japanese university students to avoid leaving home (Ozeki et al., 1994). Table 2 presents the contents of each item. Each concept is explained as follows. “Enrichment of student life” and “schoolwork performance” were compared with their counterparts in the first or second grade.

(1) Physical health

The concept of physical health ensures that the target subjects of this study are ordinary undergraduate students with good health. By referencing health status in well-being at school (Konu and Rimpela, 2002), WHO QOL (The WHO group, 1998), and other QOL scales used in outcome research for patients, from a physical perspective,
the scale comprises six items, such as overall sense of health, eating habits, digestive symptoms, and pains. Subjects were asked to respond on the presence of these symptoms over the past few weeks using the four-category scale of "1. Not at all," "2. Not very much," "3. Fairly common," and "4. Very common."

(2) Tendency to stay indoors
The concept of tendency to stay indoors is a growing phenomenon among Japanese university students in order to avoid leaving home. Three items are based on this concept's subscale, the Stress Coping Scale for Japanese Undergraduate Students (Ozeki et al., 1994). The four-category scale comprised the following options: "0. Not at all," "1. Rarely," "2. Sometimes," and "3. Frequently.

(3) Enrichment of student life
For students with a relatively great degree of leisure time, the concept of the enrichment of student life reflects how skillfully time can be used to lead an enriching life. The items in the concept are based on well-being concerning social relationships (Konu and Rimpela, 2002) and the items of the Life Experiences Survey (Sarason et al., 1978). The items can be divided into the following five categories: "0. This describes me," "1. This somewhat describes me," "2. This either does or doesn't describe me," "3. This does not describe me very well," and "4. This does not describe me at all." These categories were scored by inverting the scores and adding them. Concept (4) and (5) were given below can also be used five categories.

(4) Schoolwork performance
The concept of school work performance reflects the "desire to do well at school and school achievement." Each item was created based on well-being at school with regard to self-fulfillment event scales (Newcomb et al., 1981; Sarason et al., 1993).
The concept of career planning addresses the most primary problem faced by college students: the choice of a career. It measures “career choice progress” and “a positive attitude toward career planning” and is based on their developmental tasks (Havighurst, 1953), Taylor’s self-efficacy scale in career planning (Taylor and Betz, 1983), and others.

3) Absence

For the concept of absence, the subjects were questioned about the total number of days in the previous year when they had missed work or school due to sickness or feeling unwell; based on their responses, they were scored on a range of one to six points. The categories included “1. 0 days,” “2. 1–3 days,” “3. 4–7 days,” “4. 8–14 days,” “5. 15–30 days,” and “6. More than one month.” Since some disciplines and majors had very strict laboratory and experiment schedules, it was difficult to standardize absence as a health indicator for students; however, a strong relationship existed for disease in this field. Based on its previous

<table>
<thead>
<tr>
<th>Table 2</th>
<th>The well-being related items in this study</th>
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<tbody>
<tr>
<td>Physical–mental well-being</td>
<td></td>
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<tr>
<td>Physical Health</td>
<td></td>
</tr>
<tr>
<td>pm1_1</td>
<td>I am not in good condition.</td>
</tr>
<tr>
<td>pm1_2</td>
<td>I have a feeling that headache and the head are heavy.</td>
</tr>
<tr>
<td>pm1_3</td>
<td>I have a pain in the body.</td>
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<tr>
<td>pm1_4</td>
<td>I am anxious about the condition of my body.</td>
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<tr>
<td>pm1_5</td>
<td>I cannot eat food with good appetite.</td>
</tr>
<tr>
<td>pm1_6</td>
<td>There are diarrhea and constipation</td>
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<tr>
<td>Stay Indoor Tendency</td>
<td></td>
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<tr>
<td>pm2_1</td>
<td>I think that it is troublesome to meet a stranger.</td>
</tr>
<tr>
<td>pm2_2</td>
<td>I think that a thing to tell is troublesome.</td>
</tr>
<tr>
<td>pm2_3</td>
<td>I tend to shut myself up in my shell.</td>
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<tr>
<td>Psycho-social wellbeing</td>
<td></td>
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<tr>
<td>Enrichment of Student Life</td>
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<tr>
<td>ps1_1</td>
<td>From my university life, I learned various things concerning various areas.</td>
</tr>
<tr>
<td>ps1_2</td>
<td>I am becoming more aware of the world, which was previously unknown to me.</td>
</tr>
<tr>
<td>ps1_3</td>
<td>I was able to interact and deal with various persons.</td>
</tr>
<tr>
<td>ps1_4</td>
<td>I was able to acquire capabilities and learn technologies that I was earlier unable to perform and unaware of.</td>
</tr>
<tr>
<td>ps1_5</td>
<td>I was able to experience many things that can only be done by students.</td>
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<tr>
<td>ps1_6</td>
<td>I gained some life-time friends.</td>
</tr>
<tr>
<td>Schoolwork Performance</td>
<td></td>
</tr>
<tr>
<td>ps2_1</td>
<td>There are many incomprehensive lessons.</td>
</tr>
<tr>
<td>ps2_2</td>
<td>I don’t feel like studying anything.</td>
</tr>
<tr>
<td>ps2_3</td>
<td>I acquired special knowledge and learned technology gradually.</td>
</tr>
<tr>
<td>ps2_4</td>
<td>There are many lessons which cannot be understood well.</td>
</tr>
<tr>
<td>ps2_5</td>
<td>I am able to perform well in both learning a subject and taking its test.</td>
</tr>
<tr>
<td>Career Planning</td>
<td></td>
</tr>
<tr>
<td>ps3_1</td>
<td>I am slowly developing a desire to work.</td>
</tr>
<tr>
<td>ps3_2</td>
<td>My notions regarding a course are now clearer.</td>
</tr>
<tr>
<td>ps3_3</td>
<td>I turned to be clearly what I suite in future.</td>
</tr>
<tr>
<td>ps3_4</td>
<td>I assimilate the information regarding a course.</td>
</tr>
</tbody>
</table>
usage in other studies as a general indicator of health (Marmot et al., 1995), it was included in this study.

4) General Health Questionnaire (GHQ)

GHQ has been repeatedly used as an indicator of the mental well-being of university students (Creed and Evans, 2002; Roberts et al., 1999). The twelve-item GHQ (Goldberg, 1972; McDowell and Newell, 1996), which has shown reliability and validity in its application in Japan, was selected for this study. It was scored with 0–0–1–1 scoring that is 1 or 2 equal to 0 and 3 or 4 equal to 1 at the each item of 4 point Likert scale using the GHQ method (McDowell and Newell, 1996); the lower scores reflected better health condition.

3. Construction of the proposed model and the statistical analysis

1) SOC stability model

Antonovsky (1987) proposed a second-order three-factor SOC construct model (Fig. 2). Particularly, Feldt and Rasku (1998) proposed the following two modules: (1) the modified SOC13 construct model that added covariance between the residual variances of Q2 and Q3 and (2) SOC11 construct model that omitted Q2 and Q4. In this study, the former was termed “SOC13” and the latter, “SOC11.”

To examine the stability of the factor structure of SOC13 and SOC11, a structural equation modeling was performed; the unconstrained model was compared with the constrained model, which had the same factor loading or path coefficients in between two points. If the latter had a good model fit or was unchangeable in the unconstrained model, the factor structure would be stable.

2) The well-being model of undergraduate students

In this study, five concepts and two indices pertaining to SOC’s prediction of comprehensive well-being was considered. Physical health, tendency to stay indoors, absence, and GHQ indicate a stress reaction or break-down in a salutogenic model. The relationship of these concepts with SOC was repeatedly examined (Eriksson and Lindstrom, 2006). Hence, these concepts are the lower concepts of a single broader concept that relates to a stress reaction. We termed this as “physical–mental well-being.”

Enrichment of student life, schoolwork performance, and career planning do not indicate stress reaction or a break-down in the stress process model and salutogenic model or as “physical–mental well-being,” but indicate the well-being that relates to SOC (Antonovsky, 1987). Therefore, these three concepts were the lower concepts of a single broader concept termed as “well-being” by Antonovsky. We termed this “psychoso-
cial well-being.” This second-order model with two broader factors and seven lower factors is shown in Fig. 3. Further, we performed confirmative factor analysis. Since each concept has the possibility of being different as a result of its attributes, in this model, we controlled for the following attributes: gender, school, and grade.

3) Predictive validity of SOC for the well-being model of undergraduate students

To examine the predictive power of SOC, we took SOC–Intercept and SOC–Slope into account; this is because according to Antonovsky (1987), the subjects of our research, who are in their late teens or early twenties, are in the SOC formation/growth stage. Therefore, we used the Latent Growth Curve Model (Duncan et al. 1999) for the proposed model, with the intercept＝level and slope＝change as latent variables (Fig. 4).

The software Amos7.0 was used for all these analyses. Following model fit, indices and criteria were applied to a ratio of chi-square to degrees of freedom (\( \chi^2/df \)) of less than 5.0, comparative fit index (CFI) above .90, the root mean square error of approximation (RMSEA) below .08, and the lower Akaike’s information criterion (AIC).

### III Results

1. Traits observed in the study participants’ scores on the SOC13

At the baseline level, the SOC score was 48.7±10.2 \( (n=406) \) for the students who agreed to participate in the follow-up survey and 47.5±9.8 \( (n=163) \) for those who did not. There was no significant difference between the groups. Of the 406 individuals who received the follow-up survey questionnaires, the average baseline SOC score of those who responded and were analyzed during the follow-up was 48.7±9.9 \( (n=281) \) and that of those who held back was 50.5±4.0 \( (n=2) \); further, the average baseline-SOC score of those who did not respond was 48.5±11.1 \( (n=123) \). Moreover, in these cases, no significant difference was observed (Table 1).

2. Stability of the factor structure of SOC (Table 3)

To examine the factor structure of SOC, structural equation modeling of T1SOC to T2SOC was performed. On SOC13 and SOC11, the first–order factor time 1 and time 2 manageability had negative estimated residual variance, for example, the Heywood cases (Chen et al. 2001). Therefore, the variances were restricted to lower bound (0.01).
The same phenomenon occurred during the confirmatory factor analysis of SOC (Feldt and Rasku, 1998; Togari and Yamazaki, 2005). Table 3 shows the comparison of the unconstrained model with the constrained model. In both SOC13 and SOC11, the constrained model did not have a $\chi^2$ difference from the unconstrained model. Moreover, $\chi^2$/df was lower than 2, CFI was greater than .90, RMSEA was less than .05, and AIC was the lowest. Consequently, the constrained model was accepted.

Meanwhile, the model fits without covariance between Q2 and Q3 were slightly lower than those with covariance ($\chi^2$/df=1.48, CFI=.92, RMSEA=.04). Therefore, following Feldt et al. (2000) and Veenstra et al. (2005), we apply the model with the covariance throughout this analysis. The standardized path coefficients of the accepted models have been shown in Fig. 5–1 (SOC13) and Fig. 5–2 (SOC11).

### 3. The well-being model of undergraduate students: second-order model.

The confirmative factor analysis was performed for the well-being model on the factors predicted by SOC. This model had goodness model fit indices ($\chi^2$=436.236, df=316, $\chi^2$/df=1.381, CFI=.949, RMSEA=.037). We applied this model in our
Results of Antonovsky’s 2nd-order & 3-factor model of SOC13 in 2 time points

Note.
co = sense of comprehensibility, ma = sense of manageability, me = sense of meaningfulness
There are covariances between pairing error variables for two points. (e.g., e1_2 and e2_2, d1_1 and d2_1 etc.)

Variances of d1_2 and d2_2 fixed on .01 because caused Heywood case.
Standardized path coefficients was shown. All path coefficients in this figure were significant (p < .001).

Results of Feldt’s 2nd-order & 3-factor model of SOC11 in 2 time points

Note.
co = sense of comprehensibility, ma = sense of manageability, me = sense of meaningfulness
There are covariances between pairing error variables for two points. (e.g., e1_2 and e2_2, d1_1 and d2_1 etc.)

Variances of d1_2 and d2_2 fixed on .01 because caused Heywood case.
Standardized path coefficients was shown. All path coefficients in this figure were significant (p < .001).
The stability of the second-order factor structure of the Japanese version of SOC13 and SOC11 was clarified. Although this had been proved in Finland and Norway (Feldt et al., 2000; Kivimäki et al., 2000; Veenstra et al., 2005), it was proved for the first time in Japan. In addition to having factorial validity that is a second-order three-dimensional model among undergraduates, SOC13 and SOC11 also exhibit factorial stability. The stability coefficient of 0.72 was almost the same as the score observed in other countries (Feldt et al., 2000; Kivimäki et al., 2000; Veenstra et al.,

**IV Discussion**

At Time 1, the students were questioned whether they would agree to participate in another survey after two years or not. However, in the baseline phase, no significant differences were observed in the Time 1 SOC13 scores between the groups who had agreed to participate in the survey after two years and those who had not. On the other hand, the response rates were rather low (69.2%). However, the Time1 SOC13 scores were not significantly different between those who had submitted and those who had not submitted the completed questionnaires. Hence, the response bias in the follow-up research was considered to be negligible to some extent.

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moreover, it was a stable construct to some extent.

However, it was necessary to pay attention to the Heywood case. These phenomena existed at the same point in the Finnish and Norwegian version as well. There was possibility of the matter of sample or model itself (Chen et al., 2001). It is difficult to decide the pattern that was the solution to the issues; the former pattern is an accidental case and the latter pattern is a caused model structure or item wording. Although assumed that the solution of this study was the former pattern, it is possible that this SOC scale was the latter pattern. Therefore, it may be necessary to revise item wordings of manageability in future research because SOC comprises of three lower concepts (Antonovsky, 1987).

The well-being model was defined in this study by referring to considerable school well-being models (Konu and Rimpela, 2002), developmental tasks (Havighurst, 1953) and the Quality of Life of university students (Raphael, 1996). However, the model fit obtained was better than what we intended. It is possible that this well-being model sufficiently represented their subjective well-being. Although in this model, we controlled for their attributes statistically because this study data has a small sample size, in future research, it will be necessary to do a replication on a large sample that is separately divided into attributes such as gender, grade, and school.

This study found a strong influence of SOC-Intercept i.e. SOC levels and SOC-Slope i.e. SOC changes on psychosocial well-being as well as

Fig. 7-1 Results of predictive varidity model where SOC-Level & SOC-Change (SOC-13) predict well-being of collodge students.

note. 1-order observed indicator variables were omitted.
Controlled for gender, school, and grade about Physical-mental/ Psycho-social well-being.
*p<.05, **p<.01, n.s. non significant and no mark coefficients were significant (p<.001).
Standardized path coefficients was shown.
χ²=2018.674, df=1345, χ²/df=1.501, CFI=.856, RMSEA=.042 on Fig. 7-1.
physical–mental well–being. The results reveal that the SOC levels of university students and the subsequent changes are predictors of well–being after two years. Thus, it can be stated that the result partially proved the predictive validity of SOC13 and SOC11 scale.

Further, this study found a strong influence of SOC levels and SOC changes on physical–mental well–being. The results reveal that the SOC levels of university students and the subsequent score changes are predictors of the students’ level of well–being after two years. Moreover, the SOC predictions regarding physical–mental well–being in this study are quite similar to its prediction of morbidity (Surtees et al., 2003), self–rated health (Suominen et al., 2001), suicide attempts (Petrie and Brook, 1992), sickness absence (Kivimäki et al., 2000), SF–36 (Ristner et al., 2000; Veenstra et al., 2005), and so on. Hence, these findings confirm Antonovsky’s salutogenic model.

In addition, as mentioned in the introduction, this study confirmed that SOC can predict the psychosocial well–being of students, who successfully cope with developmental issues and self–fulfillment. These findings corroborate Antonovsky’s SOC theory that SOC influences the well–being, including successful responses to the developmental theme (Antonovsky, 1987).

The path coefficients from SOC–Intercept and SOC–Slope to the psychosocial well–being were less in comparison with those to physical–mental well–being. Since physical–mental well–being indicate stress reaction or break–down in the stress process model and salutogenic model, this result...
can be understood.

SOC11 and SOC13 affected the physical–mental well-being and psychosocial well-being of students in a similar manner. Moreover, the model fit of predictive validity model in SOC13 was almost the same that in SOC11, although the CFI in both were slightly low–level. Thus, from this study, we can assume that it is permissible to use the SOC13 or SOC11 and reserve judgment on SOC13 or SOC11, because the scores of the RMSEA in both were good. It will be necessary to compare the construct validity of SOC13 with that of SOC11 in other samples such as adult group aged 30 or over, national representative sample, and so on.

In future researches, we need to attempt the reproducibility of the results, keeping in mind the following limitations of this study. First, the target group was limited. The subjects of this study were mainly students of humanities, taken from two four–year universities in Tokyo. In future, a stratified research will be necessary for various regions and types of universities; further, studies should also consider the students who are not currently attending classes as well as dropouts. Moreover, it would be advantageous to conduct research on adolescents of a similar age–group who have been unable to advance to higher education.

Second, the sample size was slightly small in this study because the CFI of the predictive validity model were all small.

Third, although physical–mental well-being measured the recent conditions and psychosocial well-being measured the transition after two years, our analysis lacked a precise control of the conditions in the baseline phase. Therefore, in future research, it will be necessary to examine the causal association by using a cross–lagged model and/or synchronous effect model after measuring the baseline condition (Veenstra et al., 2005).

Finally, this study was limited to two phases. For obtaining exact measurements, it is necessary to evaluate more than three phases and then estimate the changes (Bast and Reitsma, 1997; McArdle and Aber, 1990).

The predictive value of the SOC scale demonstrates that the role that SOC plays in maintaining health is an important one because it improves the well–being of students: moreover, it suggests the value of early SOC screening and follow–up observation on university students. In addition, it highlights the importance of developing intervention programs and finding factors that work to increase or lower SOC scores.

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