Developmental Trajectories of Event Centrality and Socio-Emotional Well-Being after Transition to High School

Shuhei Iimura*¹

¹ The University of Tokyo, Japan Society for the Promotion of Science

*Corresponding author information: Corresponding concerning this article should be addressed to Shuhei Iimura, The University of Tokyo, 7-3-1 Hongo Bunkyo-ku, Tokyo 113-0033, Japan. (e-mail: iimurashuhei@gmail.com)

Abstract:

Although the transition from junior high or middle school to high school can be a stressful turning point for youth socio-emotional development, the role of individual differences in susceptibility to the transition in adolescents' socio-emotional well-being remains unclear. The current study examined the developmental relation between how central the high school transition is to a student's identity or life course (i.e., event centrality) and socio-emotional well-being after transition. High school students, including cohorts in 10th to 12th grade ($n = 2,265$, M_{age} at Time 1 = 15.9 years, $SD_{\text{age}} = 0.9$ years), participated in a four-wave longitudinal survey for a year, and completed questionnaires assessing event centrality and socio-emotional well-being. Latent growth curve modeling revealed individual differences in the developmental trajectory of event centrality regarding high school transition across the 10th to 12th grades. Increase in the centrality of transition was closely associated with improvement in socio-emotional well-being for each grade progression. Findings highlight the value of examining individual differences in the degree to which the school transition becomes a turning point in a student's identity or life course.

Keywords:

school transition, event centrality, socio-emotional well-being, adolescence, latent growth curve model

Data availability statement:

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Developmental researchers may intuitively assume individual differences in the influence of the transition from junior high school to high school on youth socio-emotional development. However, current knowledge on the role of susceptibility to school transition in the development of socio-emotional well-being is largely limited. The present study aimed to provide evidence that individual differences in how central the high school transition is in becoming a turning point for a student's identity or life course are closely related to the development of the Japanese student's socio-emotional well-being.

The transition to high school is known as a predictable and normative life event in several countries, including the United States (Benner, 2011) and Japan (Iimura & Taku, 2018). The timing of transition from junior high school (or middle school) to high school depends on the country's educational system. For example, most Japanese students spend six years in elementary school, three years in junior high school, and three years in high school (also called the 6-3-3 system); students can also choose the 6-6 system, but those who do so represent a minority (for details, see Supplementary Materials Figure S1). Although educational systems vary by country, the school transition in common occurs during developmental stages when most students are also experiencing physical and psychological changes dynamically (Berenbaum, Beltz, & Corley, 2015; Lord, Eccles, & McCarthy, 1994). Changes in school environments, therefore, can be cumulatively stressful turning points for many adolescents under unstable conditions related to pubertal development.

Indeed, in systematic reviews of research on the high school transition, many scholars have observed disruptions in student functioning across developmental domains (e.g., Benner, 2011). For example, students experience declines in self-esteem (Barber & Olsen, 2004), social support (Newman, Newman, Griffen, O'Connor, & Spas, 2007), and sense of school belonging (Benner & Graham, 2009) on average; they also express depression (Newman et al., 2007), anxiety (Benner & Graham, 2009), and loneliness (Benner, Boyle, & Bakhtiari, 2017) after the transition to high school, suggesting that some students cognitively struggle with the requisite transitional tasks to adjust to their new school settings (Iimura & Taku, 2018). According to stage-environment fit theory (Eccles et al., 1993), these declines in socio-emotional well-being may be the result of the potential mismatch between the student's developmental status and

school environment. Most studies have reported that being of a racial/ethnic minority may be a robust factor that contribute to the decrease in socio-emotional well-being (e.g., Benner & Graham, 2007), but the effects of other covariates, including gender, currently seem to be inconsistent across studies.

To identify the dominant covariates that strongly contribute to youth socio-emotional development after the high school transition, we may need to focus on the student's subjective appraisal of their experience of the transition. Facchin, Margola, Molgora, and Revenson (2014), for instance, conducted a school-based intervention of expressive writing, and they found that students who write about the positive aspects of high school transition in relation to benefits and advantages developed a positive self-conception compared with those assigned to other conditions (i.e., standard expressive writing and factual writing). This finding is significant because it suggests individual differences in the subjective appraisal of the school transition, which can be transformed and relate to youth socio-emotional development. Nevertheless, knowledge as to how the student's subjective appraisal of high school transition relates to their status of adaptation in high school is limited.

The individual's subjective appraisals of stressful life transition can be captured by the concept of event centrality. The core idea of event centrality is that "a memory for a stressful event forms a reference point for personal identity and for the attribution of meaning to other experiences in a person's life" (Berntsen & Rubin, 2006, p. 220). Personal memories of a momentous event, from normative stressful life events to traumatic events, are characterized by importance, definiteness, and brevity, which are likely to function as a salient turning point that alters or redirects the life course (e.g., Pillemer, 1998). Such memories become reference points when persons form their identity. In the context of the current study, for example, some adolescents would recognize themselves as "a high school student," not "a junior high school student," to recall their experience of the high school transition.

To measure the degree to which a momentous event, including life transition, is central to an individual's identity or life course, the Centrality of Event Scale can be used (Berntsen & Rubin, 2006). This scale is composed of a series of items that reflect whether an event had become a reference point for the way a person understands their self and the world in their life, whether an event had contributed a central component to individual identity, and whether an event had altered a person's life course. Individual differences in event centrality are reported in

several studies (for a review, see Gehrt, Berntsen, Hoyle, & Rubin, 2018).

Imura and Taku (2018) reported the relation between centrality of the high school transition and the student's functioning. They demonstrated that students who recognize the transition as a salient turning point for their identity or life story show positive developmental changes from shortly before to shortly after the transition in relation to others, future time perspectives, personal strength, spirituality, and appreciation of life. These changes can occur because students with high event centrality have clearly understood the association between themselves and the high school transition, for example, in the form of importance of school life; thus, they can independently thrive in their high school life.

As noted above, prior findings suggest that individual differences in event centrality are related to youth socio-emotional development following the high school transition. However, early reports have two limitations. First, the relation between the plasticity of event centrality and development of socio-emotional well-being remains unexamined. Second, the longitudinal role of event centrality across high school life continues to be unknown owing to the short time interval of surveys. Although prior research, conducted by Facchin et al. (2014), suggests that it is possible to change a student's event centrality regarding high school transition, no such evidence has been explored. Taken together, to promote the current understanding of the relation between individual differences in event centrality and socio-emotional well-being after transition, studies need to expand the time span for surveys and capture changes in event centrality of the transition.

Overview of the Current Study

To clarify the aforementioned two issues, the current study, using a Japanese sample of 10th- to 12th-grade cohorts, aimed to explore the developmental trajectories of event centrality regarding the high school transition and its association with changes in socio-emotional well-being. To our knowledge, although there are no international comparative developmental researches on high school transition, Japan's unique educational system, such as the high school entrance exam, may cause individual differences in the event centrality and socio-emotional adjustment after the transition, in addition to simply changes in school environment (e.g., Imura, 2018; Imura & Taku, 2018). Specifically, unlike the high school transfer system in many Western countries, the majority of students in Japan (i.e., 6-3-3 system) have to pass an achievement-based selection test to enter the high school of their choice. Each high school has a

different level of difficulty in enrolling, and students cannot enroll in high school unless they exceed the high school's required test score. In that case, students will go to a different high school than they want; on the other hand, students may be able to enter the high school they want, but the school environment may be different from what they expected. Therefore, physical and psychological gaps resulting from such transitions may affect the development of event centrality and socio-emotional adjustment after high school transition.

The present study also examined the impact of covariates, including the type of high school (6-3-3 system vs. 6-6 system), and type of choice (number one choice vs. other), and gender (boy vs. girl) on development of event centrality and socio-emotional well-being following the school transition. Empirical studies in Japan to date have been limited, but as mentioned above, the impact on the socio-emotional development of students will differ depending on whether students are transferred to high school under the 6-6-3 system, which requires entrance examinations for high school, or the 6-3 system, which does not require it. Similarly, whether a student entered the high school of his or her first choice may partly explain the development of event centrality and socio-emotional well-being. Additionally, from the perspective of biological development, gender differences in pubertal development are prominent among junior and high school students (e.g., girls mature faster than boys in general; Berenbaum et al., 2015), and the association with socio-emotional development such as depression has been pointed out (e.g., Ge, Conger, & Elder Jr, 2001); therefore, gender was included in the covariates in this study.

Methods

Participants and Procedure

We conducted the year-long, four-wave longitudinal study, named Adolescent Development during Transition to High School Project, in five high schools in Tokyo. Of the five schools, two were integrated junior and senior high schools (six-year system), and three were normative high schools (three-year system). Supplementary Figure S1 depicts the relationship between the Japanese school system and the current participants. The first survey was conducted in July, about three months after the start of a new school term in Japan. Thereafter, surveys were conducted about every three months. Before the start of each survey, informed consent was obtained from both students and parents. There was no reward for research

cooperation. All procedures in the current study were approved by the institutional review board of Chuo University (approval number: 2017-4).

The interval between the surveys was three months. At the first measurement, 2,265 students (1,071 girls, $M_{\text{age}} = 15.9$ years, $SD_{\text{age}} = 0.9$ years) who attended high school, including cohorts in the 10th to 12th grades (i.e., first to third year of high school), completed questionnaires assessing event centrality and socio-emotional well-being. Data were subsequently collected from 2,190 students in Time 2 (1,112 girls, $M_{\text{age}} = 16.3$ years, $SD_{\text{age}} = 1.0$ years); 1,493 students in Time 3 (755 girls, $M_{\text{age}} = 16.2$ years, $SD_{\text{age}} = 0.8$ years); and 2,463 students in Time 4 (1,228 girls, $M_{\text{age}} = 16.6$ years, $SD_{\text{age}} = 0.9$ years). At each time point, we recruited students who had not participated in the previous survey. Finally, 1,023 students participated in all of the surveys. Little's missing completely at random (MCAR) test indicated that missing values were MCAR for the 10th grade ($\chi^2 (193) = 207.69, p = .222$) but not for the 11th ($\chi^2 (147) = 188.32, p = .012$) and 12th grades ($\chi^2 (147) = 205.41, p < .001$).

Measures

Event centrality. To measure how central the transition to high school was to a student's identity and life story, we used the seven-item Japanese version of the Centrality of Event Scale (Naka, 2008). This scale is a widely used measure of event centrality with excellent psychometric properties (Berntsen & Rubin, 2006). Example items of this scale are "the event has colored the way I think and feel about other experiences" and "I often think about the effects this event will have on my future." Items were scored on a six-point scale, ranging from 1 (*totally disagree*) to 6 (*totally agree*) points. For the current sample, these items showed strong internal consistency over the four time-point surveys; Cronbach's alpha was .90 for Time 1, .93 for Time 2, .94 for Time 3, and .94 for Time 4. The autocorrelation coefficient between surveys was $r = .57$ ($p < .001$) on average.

Socio-emotional well-being. Students rated their socio-emotional well-being in the last two weeks using the Japanese version of the World Health Organization (WHO)- Five Well-Being Index (WHO-5-J; Awata et al., 2007). This index includes five items, such as "I have felt cheerful and in good spirits" and "I have felt calm and relaxed." Students scored them on a six-point scale, ranging from 1 (*at no time*) to 6 (*all of the time*) points. Cronbach's alpha for Time 1 to Time 4 was .90, .93, .94, and .94, respectively, indicating good internal consistency. The average autocorrelation coefficient (i.e., rank order stability) from Time 1 to Time 4 was $r = .46$

($p < .001$).

Covariates. We measured three time-invariant covariates as follows. (a) Students reported the type of school to which they belong. School type was coded as 0 for integrated junior and senior high school and 1 for normative high school. In Japan, junior high school students need to pass entrance examinations to enter normative high school, whereas students attending integrated junior and senior high schools do not need it. Therefore, the degree of change in school environment following transition is greater in students who enter normative high schools compared with those who belong to integrated schools in general. (b) Students also answered whether the high school they entered was their number one choice or not, given that Japanese students are not always able to enter the school they desire because of the selection by entrance examinations as noted above. This item was coded as 0 for number one choice and 1 for others. (c) Finally, students reported their gender (boys were coded as 0, girls, as 1).

Statistical Analysis

To examine developmental trajectories in event centrality and socio-emotional well-being after the transition to high school, we conducted latent growth curve modeling (LCM; for details, see Duncan, Duncan, Stryker, & Alpert, 1999; Figure 1) in two steps.

First, we used univariate multi-group LCMs that assumed the same model for each grade (i.e., 10th, 11th, 12th grades), with estimation of Full Information Maximum Likelihood, to reveal the developmental trajectories of event centrality and socio-emotional well-being separately. We identified the optimal shapes of trajectories based on the Akaike Information Criterion (AIC) and delta chi-square ($\Delta\chi^2$) difference test for three types of LCMs: model with no slope, model with linear slope, and model with quadratic slope. The model with no slope indicated that developmental trajectories were constant over time (i.e., stable); no latent variable for slope was included in this model. In the model with linear slope, developmental trajectories showed linear changes over time. The model with quadratic slope assumed that longitudinal data followed quadratic trajectories. To express these trajectories, path coefficients from latent variables for slope to observed variables at each occasion were fixed to 0, 1, 2, and 3 in the linear slope and 0 ($= 0^2$), 1 ($= 1^2$), 4 ($= 2^2$), and 9 ($= 3^2$) in the quadratic slope models. The fixed effects, representing the means of the intercept and slope, indicate overall trajectories of event centrality and socio-emotional well-being; the random effects, representing the variances of the intercept and slope, capture the between-person process. To compare the best models, the goodness of fit

was interpreted as follows: The lower the Bayesian information criterion (BIC) and Akaike information criterion (AIC), the better the model. If the $\Delta\chi^2$ difference test is significant, it supports the alternative model (e.g., a model with linear slope) rather than the baseline model (e.g., a model without slope).

Second, we conducted bivariate multi-group LCMs with time-invariant covariates based on the models specified in the first step, to examine relations between changes in event centrality and socio-emotional well-being. As illustrated in Figure 1, this model estimated covariance between intercept and slope for event centrality and socio-emotional well-being (paths A–F). Effects of time-invariant covariates, including gender, type of school, and type of choice, on intercept and slope were also estimated (paths a1–c4).

Model fitting was evaluated based on multiple criteria, including comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR), with $CFI > .90$, $RMSEA < .08$, $SRMR < .08$ indicating acceptable model fit (Schermelleh-Engel, Moosbrugger, & Müller, 2003). Analyses were conducted using R ver. 3.4.4. (R Development Core Team, 2017) and “lavaan” package (Rosseel, 2012).

[Figure 1]

Results

Development of Event Centrality

Table 1 shows the means and standard deviations for event centrality. The intraclass correlation coefficient (ICC) indicated moderate test-retest reliability over the four time points ($ICC = .58$, 95%CI [.55, .61], $p < .001$). In addition, the ICC at the class level was $0.02 \sim 0.03$ ($ps < .002$) across occasions. The longitudinal factorial invariance (Widaman, Ferrer, Conger, 2010) test confirmed that the Centrality of Event Scale measured the same factor structure over four time points (see Supplementary Materials Table S1).

The AIC and $\Delta\chi^2$ difference tests supported that the model with a linear slope was best fitted to capture the mean-level developmental trajectories of event centrality after school transition (Table 2). The model with linear slope showed a good fit to data: $CFI = 0.98$, $RMSEA = 0.06$, $SRMR = 0.04$.

[Table 1] [Table2]

Table 3 shows the estimated growth parameters of univariate multi-group LCMs (see

also Appendix Figure A1). For all grades, event centrality increased over about a year on average (i.e., fixed effects), but the coefficients were extremely small (mean slope <0.06, $ps < .003$). Variances of intercept and slope (i.e., random effects) were significant for all grades, suggesting individual differences in scores at Time 1 and subsequent changes.

[Table 3]

Development of Socio-Emotional Well-being

Descriptive statistics for socio-emotional well-being are presented in Table 1. The ICC for socio-emotional well-being was somewhat low, suggesting that intra-individual variation was relatively large over the four-time points (ICC = 0.47, 95% [.44, .50], $p < .001$). At the class level, the ICC was 0.02 ~ 0.06 ($ps < .001$) across occasions. The factor structure of socio-emotional well-being measured by the WHO-5-J was supported to measure invariant over four time points (see Supplementary Materials Table S2).

As presented in Table 2, results showed that the model with linear slope was the most optimal compared with the models with no slope and with quadratic slope. The model with linear slope indicated an acceptable fit to the data: CFI = 0.94, RMSEA = 0.08, SRMR = 0.06.

As shown in Table 3 (see also Appendix Figure A1), mean slopes (i.e., fixed effects) were significant for all grades, but the coefficients were extremely small for the 10th and 11th grades (mean slope <.05, $ps < .012$). In contrast, the degree of change was relatively large for the 12th grade (mean slope = .17, $p < .001$), implying that, on average, their socio-emotional well-being positively changed toward graduation. Although slope variance (i.e., random effects) was significant for only the 10th grade, individual differences in the intercept were found for all grades.

Associations between Event Centrality and Socio-Emotional Well-Being

Results showed that bivariate multi-group LCMs fitted the data well: CFI = 0.97, RMSEA = 0.04. SRMR = 0.04. As illustrated in Figure 2, we estimated the correlation coefficients between intercepts and slopes for event centrality and socio-emotional well-being. The intercept of event centrality was positively associated with that of socio-emotional well-being for all grades ($r = .52-.58$, $ps < .001$), suggesting that students who recognized the high school transition as an important turning point for their own identity or life story were likely to report a good status of socio-emotional well-being at Time 1. Results also showed positive relations between changes in event centrality and socio-emotional well-being for the 10th (r

= .63, $p < .001$), 11th ($r = .78, p = .097$), and 12th graders ($r = .59, p < .001$). Students who reported increased event centrality regarding the high school transition improved their socio-emotional well-being from Time 1 to Time 4. For the 10th graders, the intercept of socio-emotional well-being negatively related to the slope of event centrality, but the effect size was low ($r = -.18, p = .026$).

[Figure 2]

Effects of covariates on intercepts and slopes. We also estimated the effects of time-invariant covariates on the intercepts and slopes of event centrality and socio-emotional well-being (Table 4). For the 10th graders, no effects of covariance were found. For the 11th graders, girls were higher than boys in the intercept of event centrality ($b = 0.26, SE = 0.07, p < .001$), whereas the degree of changes in event centrality was greater in boys than girls ($b = -0.08, SE = 0.02, p = .005$). For the 12th graders, boys’ socio-emotional well-being was higher than girl’s in Time 1 ($b = -0.22, SE = 0.09, p = .018$). In addition, students who entered their first-choice high school had high event centrality ($b = -0.30, SE = 0.11, p = .008$) and socio-emotional well-being ($b = -0.31, SE = 0.11, p = .004$) compared with those who did not. As additional information, the results of a measurement invariance test between grades in the conditioned LCMs were provided in the Supplementary Materials Table S3.

[Table 4]

Discussion

Although development researchers have assumed that susceptibility to school transition varies among students, no previous study has directly described the developmental nature of such individual differences and their role for socio-emotional well-being during a student’s school life. The current research was the first large-scale longitudinal study that revealed the relation between event centrality and socio-emotional well-being after the transition to high school. The results showed developmental diversity across the 10th to 12th grades in trajectories of event centrality regarding the transition to high school (see Table 2). Our findings also indicated that increased centrality of the transition was positively associated with improvement of socio-emotional well-being for 10th and 12th graders (see Figure 2). Consequently, the current study provided the first empirical evidence regarding this topic. To shed further light on the relation between school transition and adjustment, future studies should assume individual differences in

the degree to which the school transition becomes a turning point in a student's identity or life course.

Although the results showed positive changes in the centrality of the transition in all grades on average, we should interpret these findings with caution. It was almost stable because the estimated mean slope parameters were extremely small. Moreover, it should be noted here that individual differences (i.e., random effects) in the initial value and development of event centrality were clearly apparent, as indicated by parameters regarding variance. Although the shape of trajectory has not been examined, with most researchers having assessed event centrality using cross-sectional design (for a review, see Gehrt et al., 2018), our findings demonstrated that plasticity may remain in the development of event centrality after high school transition. In other words, the relationship between event centrality regarding high school transition and students' socio-emotional well-being can change over time.

Additionally, we would like to emphasize two findings regarding individual differences in socio-emotional well-being to promote the current understanding of youth development after school transition as follows. First, significant variance in intercepts was shown in all grades, suggesting that the status of socio-emotional well-being clearly differed among students relatively soon after entering high school. In this regard, both the mean and variance should be considered to capture socio-emotional well-being after the school transition, which may be useful for intervention and education. Second, Japanese students in the 12th grade (i.e., those who are spending their final year of high school) showed increased socio-emotional well-being toward graduation. This finding was in contrast to a study involving a high proportion of ethnic minority students conducted in the United States that reported increasing depression and loneliness from entering to graduating high school (Benner & Graham, 2009). This possibility might be influenced by cultural factors. Unlike high schools in the United States, the student population of Japanese high school has very little ethnic diversity. For example, the Japanese government reported that fewer than 3,000 students use primary languages other than Japanese in 2016 (Ministry of Education, Culture, Sports, Science, and Technology in Japan, 2017). Therefore, the difficulties associated with the high school transition experienced by race or ethnic minority adolescents in the United States (e.g., Benner & Graham, 2009) are rarely addressed in Japanese high schools, where the majority of students are Japanese nationals.

Meanwhile, our findings were interestingly similar to a study in Germany that showed

students taking their final exam to enter university reported increased conscientiousness and achievement behavior and decreased neuroticism toward graduation (Bleidorn, 2012). Similar to the German study, most of the Japanese 12th-grade students in the current study took exams to enter university between Times 3 and 4 and many of them had finished taking the exams at Time 4. From these common points between Germany and Japan, the clear goal after graduation (e.g., taking exams and entering university) may enhance, on average, a student's socio-emotional well-being right before graduation (e.g., Iimura, 2018).

Our findings also demonstrated the strong relation between event centrality and socio-emotional well-being across all grades; especially, the intercept–intercept and slope–slope associations were remarkable. Specifically, the intercept of event centrality was positively correlated with the intercept of socio-emotional well-being ($r > .52$), and the slope of event centrality was related to the slope of socio-emotional well-being ($r > .59$). Thus, the event centrality of the high school transition may play an important role in the positive development of socio-emotional well-being in a student's life. This implication corresponds with some findings on student functioning following the high school transition (e.g., Facchin et al., 2014; Iimura & Taku, 2018). As Facchin et al. (2014) reported, for example, a school-based expressive writing intervention that allows students to describe the benefit of school transition can be an effective method to increasing the event centrality of the transition, leading to enhanced socio-emotional well-being.

Although limited to the 11th grade, we found gender differences in event centrality: the degree to which high school transition contributed to one's identity or life story was higher in girls compared with boys. This finding was consistent with a meta-analytic study (Gehrt et al., 2018) that examined the correlation between the Centrality of Event Scale and gender, in which females have slightly higher scores ($r = .11$). Research on event centrality has pointed out that females having more detailed emotional memories may be the cause of gender differences (e.g., Boals, 2010; Gehrt et al., 2018). However, the effect size of gender was small in both previous research and the current study. Therefore, the role of gender differences in event centrality should not be overestimated; rather, individual differences should be given focus.

Limitations and Implications

Our findings promote further understanding of adolescent development following the

transition to high school. Nonetheless, several limitations should be considered. First, our results might be dependent on ethnicity and cultural factors, given the use of a Japanese sample and system of education; thus, future research using other samples is required, to replicate and validate our findings. Second, school type (i.e., 6-3-3 system vs. 6-6 system) and choice type (i.e., whether the school students entered is his/her first choice or not) were included in the analysis of this study as potential covariates specific to the Japanese education system, but they did not explain individual differences in development of both event centrality and socio-emotional well-being during the 3 years of high school life. Although the Japanese government is currently promoting the 6-6 system, which does not require major changes in the school environment and high school entrance exams, to prevent students' maladjustment (Ministry of Education, Culture, Sports, Science and Technology in Japan, 2013), it may not be an evidence-based policy based on the findings of this study. Other covariates (e.g., improving the quality of the high school environment; Iimura & Kibe, 2020) may need to be investigated in future studies to consider desirable interventions and educational policies that support students' socio-emotional well-being.

Conclusions

To our knowledge, no research on school transition has directly focused on individual differences in susceptibility to the school transition. The present study provided the first evidence that students clearly differ in the centrality of the transition to high school. Researchers and educators should consider individual differences in the degree of centrality of the transition to the student's identity or life story, because it is closely associated with socio-emotional well-being during school life.

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Table 1
Means and Standard Deviations for Event Centrality and Socio-Emotional Well-being

	Time 1		Time 2		Time 3		Time 4	
	<i>Mean</i>	<i>(SD)</i>	<i>Mean</i>	<i>(SD)</i>	<i>Mean</i>	<i>(SD)</i>	<i>Mean</i>	<i>(SD)</i>
Event centrality								
10th grade	2.77	(1.06)	2.81	(1.10)	2.86	(1.09)	2.85	(1.08)
11th grade	2.91	(1.19)	3.13	(1.10)	3.12	(1.12)	3.12	(1.16)
12th grade	2.50	(0.94)	3.01	(1.10)	2.87	(1.15)	2.81	(1.09)
Socio-emotional well-being								
10th grade	2.69	(1.10)	2.88	(1.01)	2.77	(1.08)	2.83	(0.96)
11th grade	2.76	(1.13)	3.16	(1.08)	3.06	(1.03)	3.14	(1.04)
12th grade	2.16	(1.04)	2.87	(1.12)	2.04	(1.38)	3.00	(0.96)

Table 2
Fit Statistics Comparing Models Without Slope, With Linear Slope, and With Quadratic Slope

Models	CFI	RMSEA	SRMR	AIC	$\chi^2(df)$	$\Delta\chi^2$ diff(Δdf)
Event centrality						
No slope (Only intercept)	.95	.06	.06	21767.02	141.09(27)***	—
Linear slope	.98	.06	.04	21718.85	74.92(18)***	-66.17(-9)***
Quadratic slope	NA	NA	NA	NA	NA	NA
Socio-emotional well-being						
No slope (Only intercept)	.88	.09	.08	22321.60	240.55(27)***	—
Linear slope	.94	.08	.06	22229.37	130.32(18)***	-110.23(-9)***
Quadratic slope	NA	NA	NA	NA	NA	NA

Note. CFI = comparative fit index, RMSEA = root mean square error of approximation, SRMR = standardized root mean square residual, AIC = Akaike information criterion, $\Delta\chi^2$ diff = chi-square difference tests (e.g., chi-square value of the linear model minus chi-square value of the no slope model), NA = not available because results did not converge, — = not available because of the baseline model.

*** $p < .001$

Table 3

Estimated Parameters of Univariate Multi-Group Latent Growth Curve Models

	Intercept						Linear Slope					
	<i>Mean</i> <i>(Fixed effects)</i>	<i>(SE)</i>	<i>p</i>	<i>Variance</i> <i>(Random effects)</i>	<i>(SE)</i>	<i>p</i>	<i>Mean</i> <i>(Fixed effects)</i>	<i>(SE)</i>	<i>p</i>	<i>Variance</i> <i>(Random effects)</i>	<i>(SE)</i>	<i>p</i>
Event centrality												
10th grade	2.75	(0.03)	<.001	0.68	(0.05)	<.001	0.04	(0.01)	<.001	0.02	(0.01)	.002
11th grade	2.72	(0.04)	<.001	0.81	(0.08)	<.001	0.06	(0.02)	<.001	0.04	(0.02)	.008
12th grade	2.92	(0.05)	<.001	0.84	(0.11)	<.001	0.06	(0.02)	.003	0.05	(0.02)	.038
Socio-emotional well-being												
10th grade	2.80	(0.03)	<.001	0.66	(0.05)	<.001	0.03	(0.01)	.012	0.03	(0.01)	<.001
11th grade	2.72	(0.04)	<.001	0.65	(0.08)	<.001	0.05	(0.02)	<.001	0.01	(0.02)	.405
12th grade	2.53	(0.05)	<.001	0.63	(0.10)	<.001	0.17	(0.02)	<.001	0.04	(0.03)	.129

Table 4
Effects of Covariates on the Intercepts and Slopes of Event Centrality and Socio-Emotional Well-Being

	10th grade			11th grade			12th grade		
	<i>b</i>	(<i>SE</i>)	<i>p</i>	<i>b</i>	(<i>SE</i>)	<i>p</i>	<i>b</i>	(<i>SE</i>)	<i>p</i>
Event centrality									
Gender -> Intercept	0.06	(0.06)	.311	0.26	(0.08)	.001	-0.01	(0.10)	.937
Type of choice -> Intercept	-0.08	(0.07)	.253	0.00	(0.10)	.998	-0.30	(0.11)	.008
Type of school -> Intercept	0.17	(0.18)	.329	0.14	(0.11)	.177	-0.05	(0.12)	.679
Gender -> Slope	0.02	(0.02)	.450	-0.08	(0.03)	.005	-0.01	(0.04)	.863
Type of choice -> Slope	0.01	(0.03)	.628	-0.03	(0.04)	.442	0.04	(0.04)	.385
Type of school -> Slope	0.08	(0.07)	.222	0.01	(0.04)	.714	0.03	(0.04)	.508
Socio-emotional well-being									
Gender -> Intercept	0.04	(0.06)	.463	-0.07	(0.08)	.393	-0.22	(0.09)	.018
Type of choice -> Intercept	-0.05	(0.07)	.466	-0.14	(0.09)	.061	-0.31	(0.11)	.004
Type of school -> Intercept	0.03	(0.18)	.857	0.06	(0.10)	.578	-0.02	(0.11)	.860
Gender -> Slope	-0.00	(0.02)	.900	0.02	(0.03)	.496	0.07	(0.04)	.043
Type of choice -> Slope	0.04	(0.03)	.100	0.01	(0.04)	.847	0.06	(0.04)	.169
Type of school -> Slope	-0.00	(0.07)	.925	-0.00	(0.04)	.979	0.03	(0.04)	.519

Note. Gender was coded as, 0 = boys and 1 = girls. Type of choice was coded as, 0 = number one choice and 1 = others. Type of school was coded as, 0 = integrated junior and senior high school and 1 = normative high school.

Figure 1. Conditioned bivariate multi-group latent growth curve model. In the figure, “integrated” refers to integrated junior high and senior high schools, whereas “normative,” to normative high schools.

Figure 2. Correlation coefficients between intercepts and slopes for event centrality and socio-emotional well-being.

Appendix

Event Centrality

Socio-Emotional Well-Being

Figure A1. Developmental trajectories of event centrality and socio-emotional well-being.

Supplementary Materials

Figure S1. The Relationship between Japanese School Systems and the Current Sample

Table S1

Longitudinal Factorial Invariance Between Four Time Points in the Factor Structure of Centrality of Event Scale

Model	BIC	AIC	χ^2 (df)	$\Delta\chi^2$ diff (df)	p
1: configural invariance	146479	145898	3207.0 (337)	NA	NA
2: weak factorial invariance	146362	145889	3233.7 (355)	26.7 (18)	.085
3: strong factorial invariance	146320	146320	3335.7 (373)	101.95 (18)	<.001

Note. Model 1 = invariant factor structure across time; Model 2 = Model 1 + invariant factor loadings across time; Model 3 = Model 2 + invariant intercepts across time; BIC = Bayesian Information Criterion; AIC = Akaike Information Criterion; NA = not available

As shown in Table S1, BIC supported that model with strong factorial invariance is best fitted to our data (CFI = .93, RMSEA = .05), while AIC and $\Delta\chi^2$ difference test supported model with weak factorial invariance (CFI = .93, RMSEA = .05); both models showed acceptable model fit. That is, this scale measures “same structure” over four time points.

The output of the weak factorial invariance model with the best fit is shown below.

Group 1 [1]:

Latent Variables:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
level =~						
ces_Mean_T1	0.613	74.968	0.008	0.993	0.613	0.583
ces_Mean_T2	0.771	24.720	0.031	0.975	0.771	0.692
ces_Mean_T3	0.999	NA			0.999	0.888
ces_Mean_T4	0.947	NA			0.947	0.867
slope =~						
ces_Mean_T1	0.935	57.125	0.016	0.987	0.935	0.889
ces_Mean_T2	0.998	112.193	0.009	0.993	0.998	0.896
ces_Mean_T3	0.814	227.933	0.004	0.997	0.814	0.723
ces_Mean_T4	0.789	213.455	0.004	0.997	0.789	0.722

Covariances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
level ~~						
slope	-0.517	NA			-0.517	-0.517

Intercepts:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.ces_Mean_T1	2.759	0.031	88.247	0.000	2.759	2.626
.ces_Mean_T2	2.772	0.033	82.776	0.000	2.772	2.487
.ces_Mean_T3	2.868	0.035	82.137	0.000	2.868	2.548
.ces_Mean_T4	2.862	0.031	93.641	0.000	2.862	2.619
level	0.000				0.000	0.000

slope	0.000				0.000	0.000
Variances:						
	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.cs_M_T1 (vare)	0.447	0.016	28.714	0.000	0.447	0.405
.cs_M_T2 (vare)	0.447	0.016	28.714	0.000	0.447	0.360
.cs_M_T3 (vare)	0.447	0.016	28.714	0.000	0.447	0.353
.cs_M_T4 (vare)	0.447	0.016	28.714	0.000	0.447	0.375
level	1.000				1.000	1.000
slope	1.000				1.000	1.000

Group 2 [2]:

Latent Variables:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
level =~						
ces_Mean_T1	0.613	74.968	0.008	0.993	0.622	0.553
ces_Mean_T2	0.771	24.720	0.031	0.975	0.784	0.666
ces_Mean_T3	0.999	NA			1.015	0.890
ces_Mean_T4	0.947	NA			0.962	0.835
slope =~						
ces_Mean_T1	0.935	57.125	0.016	0.987	0.933	0.830
ces_Mean_T2	0.998	112.193	0.009	0.993	0.997	0.847
ces_Mean_T3	0.814	227.933	0.004	0.997	0.812	0.713
ces_Mean_T4	0.789	213.455	0.004	0.997	0.788	0.683

Covariances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
level ~~						
slope	-0.484	NA			-0.478	-0.478

Intercepts:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.ces_Mean_T1	2.664	0.049	54.593	0.000	2.664	2.369
.ces_Mean_T2	2.835	0.042	67.925	0.000	2.835	2.408
.ces_Mean_T3	2.821	0.048	58.377	0.000	2.821	2.474
.ces_Mean_T4	2.877	0.041	69.831	0.000	2.877	2.495
level	0.000				0.000	0.000
slope	0.000				0.000	0.000

Variances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.ces_Mean_T1	0.561	0.069	8.132	0.000	0.561	0.444
.ces_Mean_T2	0.524	0.055	9.496	0.000	0.524	0.378
.ces_Mean_T3	0.397	0.057	7.021	0.000	0.397	0.306
.ces_Mean_T4	0.507	0.050	10.191	0.000	0.507	0.381
level	1.032	34.080	0.030	0.976	1.000	1.000

slope	0.997	14.711	0.068	0.946	1.000	1.000
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Group 3 [3]:

Latent Variables:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
level =~						
ces_Mean_T1	0.613	74.968	0.008	0.993	0.683	0.605
ces_Mean_T2	0.771	24.720	0.031	0.975	0.859	0.733
ces_Mean_T3	0.999	NA			1.113	0.963
ces_Mean_T4	0.947	NA			1.056	0.899
slope =~						
ces_Mean_T1	0.935	57.125	0.016	0.987	1.020	0.904
ces_Mean_T2	0.998	112.193	0.009	0.993	1.089	0.929
ces_Mean_T3	0.814	227.933	0.004	0.997	0.887	0.768
ces_Mean_T4	0.789	213.455	0.004	0.997	0.861	0.733

Covariances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
level ~~						
slope	-0.702	NA			-0.577	-0.577

Intercepts:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.ces_Mean_T1	2.812	0.055	51.231	0.000	2.812	2.494
.ces_Mean_T2	3.115	0.053	59.270	0.000	3.115	2.656
.ces_Mean_T3	3.062	0.073	41.694	0.000	3.062	2.649
.ces_Mean_T4	3.063	0.052	59.444	0.000	3.063	2.607
level	0.000				0.000	0.000
slope	0.000				0.000	0.000

Variances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.ces_Mean_T1	0.569	0.082	6.966	0.000	0.569	0.448
.ces_Mean_T2	0.531	0.070	7.604	0.000	0.531	0.386
.ces_Mean_T3	0.450	0.096	4.687	0.000	0.450	0.337
.ces_Mean_T4	0.574	0.089	6.421	0.000	0.574	0.416
level	1.241	41.335	0.030	0.976	1.000	1.000
slope	1.190	40.545	0.029	0.977	1.000	1.000

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Table S2
Longitudinal Factorial Invariance Between Four Time Points in the Factor Structure of WHO-5-J

Model	BIC	AIC	χ^2 (df)	$\Delta\chi^2$ diff (df)	p
1: configural invariance	113310	112885	2249.7 (159)	NA	NA
2: weak factorial invariance	113252	112899	2287.8 (171)	38.15 (12)	<.001
3: strong factorial invariance	113283	113001	2414.1 (183)	126.27 (12)	<.001

Note. Model 1 = invariant factor structure across time; Model 2 = Model 1 + invariant factor loadings across time; Model 3 = Model 2 + invariant intercepts across time; BIC = Bayesian Information Criterion; AIC = Akaike Information Criterion; NA = not available

As show in Table 2, BIC supported that model with weak factorial invariance is best fitted to our data (CFI = .91, RMSEA = .06), while AIC and $\Delta\chi^2$ difference test supported model with configural factorial invariance (CFI = .91, RMSEA = .06); both models showed acceptable model fit. That is, this scale measures “same structure” over four time points.

The output of the configural factorial invariance model with the best fit is shown below.

Group 1 [1]:

Latent Variables:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
level =~						
health_Mean_T1	1.047	32.860	0.032	0.975	1.047	0.959
health_Mean_T2	0.839	40.377	0.021	0.983	0.839	0.812
health_Mean_T3	0.713	40.873	0.017	0.986	0.713	0.666
health_Mean_T4	0.650	36.530	0.018	0.986	0.650	0.652
slope =~						
health_Mean_T1	0.685	NA			0.685	0.627
health_Mean_T2	0.863	NA			0.863	0.836
health_Mean_T3	1.005	21.655	0.046	0.963	1.005	0.939
health_Mean_T4	0.878	16.691	0.053	0.958	0.878	0.880

Covariances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
level ~~						
slope	-0.595	29.549	-0.020	0.984	-0.595	-0.595

Intercepts:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1	2.754	0.033	84.171	0.000	2.754	2.521
.health_Mean_T2	2.911	0.031	92.967	0.000	2.911	2.817
.health_Mean_T3	2.837	0.034	84.208	0.000	2.837	2.650
.health_Mean_T4	2.872	0.028	103.025	0.000	2.872	2.880
level	0.000				0.000	0.000

slope	0.000				0.000	0.000
Variances:						
	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.hl_M_T1 (vare)	0.481	0.016	29.520	0.000	0.481	0.403
.hl_M_T2 (vare)	0.481	0.016	29.520	0.000	0.481	0.450
.hl_M_T3 (vare)	0.481	0.016	29.520	0.000	0.481	0.419
.hl_M_T4 (vare)	0.481	0.016	29.520	0.000	0.481	0.484
level	1.000				1.000	1.000
slope	1.000				1.000	1.000

Group 2 [2]:

Latent Variables:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
level =~						
health_Mean_T1	0.790	NA			0.790	0.687
health_Mean_T2	0.950	NA			0.950	0.880
health_Mean_T3	0.895	NA			0.895	0.810
health_Mean_T4	0.828	NA			0.828	0.763
slope =~						
health_Mean_T1	0.790	NA			0.790	0.687
health_Mean_T2	0.950	NA			0.950	0.880
health_Mean_T3	0.895	NA			0.895	0.810
health_Mean_T4	0.828	NA			0.828	0.763

Covariances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
level ~~						
slope	-0.601	NA			-0.601	-0.601

Intercepts:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1	2.681	0.051	52.183	0.000	2.681	2.330
.health_Mean_T2	2.814	0.038	73.626	0.000	2.814	2.606
.health_Mean_T3	2.759	0.048	56.978	0.000	2.759	2.494
.health_Mean_T4	2.882	0.039	74.143	0.000	2.882	2.655
level	0.000				0.000	0.000
slope	0.000				0.000	0.000

Variances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1	0.825	0.070	11.826	0.000	0.825	0.624
.health_Mean_T2	0.445	0.053	8.336	0.000	0.445	0.382
.health_Mean_T3	0.584	0.061	9.558	0.000	0.584	0.477
.health_Mean_T4	0.631	0.050	12.505	0.000	0.631	0.536
level	1.000				1.000	1.000

slope	1.000	1.000	1.000
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Group 3 [3]:

Latent Variables:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
level =~						
health_Mean_T1	0.741	11.381	0.065	0.948	0.741	0.667
health_Mean_T2	0.822	12.629	0.065	0.948	0.822	0.703
health_Mean_T3	1.040	15.979	0.065	0.948	1.040	0.722
health_Mean_T4	0.901	13.834	0.065	0.948	0.901	0.807
slope =~						
health_Mean_T1	0.741	11.387	0.065	0.948	0.741	0.667
health_Mean_T2	0.822	12.635	0.065	0.948	0.822	0.703
health_Mean_T3	1.040	15.987	0.065	0.948	1.040	0.722
health_Mean_T4	0.901	13.841	0.065	0.948	0.901	0.807

Covariances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
level ~~						
slope	-0.532	49.583	-0.011	0.991	-0.532	-0.532

Intercepts:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1	2.438	0.055	44.663	0.000	2.438	2.195
.health_Mean_T2	2.886	0.053	54.532	0.000	2.886	2.468
.health_Mean_T3	2.304	0.094	24.456	0.000	2.304	1.600
.health_Mean_T4	3.054	0.049	62.512	0.000	3.054	2.737
level	0.000				0.000	0.000
slope	0.000				0.000	0.000

Variances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1	0.719	0.076	9.461	0.000	0.719	0.583
.health_Mean_T2	0.735	0.084	8.797	0.000	0.735	0.537
.health_Mean_T3	1.062	0.164	6.477	0.000	1.062	0.512
.health_Mean_T4	0.486	0.086	5.643	0.000	0.486	0.391
level	1.000				1.000	1.000
slope	1.000				1.000	1.000

Table S3
Measurement Invariance Between Grades in Bivariate Latent Curve Model

Model	BIC	AIC	χ^2 (df)	$\Delta\chi^2$ diff (df)	p
1: configural invariance	43274	42306	160.81 (42)	NA	NA
2: weak measurement invariance	43005	42181	83.58 (66)	-77.23 (24)	1.000
3: strong measurement invariance	42991	42214	132.57 (74)	48.99 (8)	<.001

Note. Model 1 = invariant factor structure across time; Model 2 = Model 1 + invariant factor loadings across time; Model 3 = Model 2 + invariant intercepts across time; BIC = Bayesian Information Criterion; AIC = Akaike Information Criterion; NA = not available

As shown in Table S3, BIC supported that model with strong factorial invariance is best fitted to our data (CFI = .98, RMSEA = .03), while AIC and $\Delta\chi^2$ difference test supported model with weak factorial invariance (CFI = .98, RMSEA = .06); both models showed acceptable model fit.

The output of the weak factorial invariance model with the best fit is shown below.

Group 1 [1]:

Latent Variables:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
health.level =~						
health_Mean_T1	0.508	13.145	0.039	0.969	0.510	0.469
health_Mean_T2	0.472	NA			0.475	0.467
health_Mean_T3	0.801	28.806	0.028	0.978	0.805	0.740
health_Mean_T4	0.886	32.733	0.027	0.978	0.891	0.889
health.slope =~						
health_Mean_T1	0.965	25.240	0.038	0.969	0.966	0.889
health_Mean_T2	1.196	22.860	0.052	0.958	1.198	1.177
health_Mean_T3	1.125	37.554	0.030	0.976	1.126	1.034
health_Mean_T4	1.098	39.946	0.027	0.978	1.099	1.097
ces.level =~						
ces_Mean_T1	0.572	63.116	0.009	0.993	0.579	0.555
ces_Mean_T2	0.596	79.806	0.007	0.994	0.604	0.541
ces_Mean_T3	0.878	69.158	0.013	0.990	0.889	0.798
ces_Mean_T4	1.015	65.456	0.015	0.988	1.027	0.946
ces.slope =~						
ces_Mean_T1	0.859	34.595	0.025	0.980	0.861	0.825
ces_Mean_T2	1.078	42.458	0.025	0.980	1.081	0.967
ces_Mean_T3	0.953	41.871	0.023	0.982	0.955	0.857
ces_Mean_T4	0.907	43.544	0.021	0.983	0.909	0.837

Regressions:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
health.level ~						
gender_intgrtd	0.103	NA			0.102	0.053

choice_intgrtd	0.168	NA			0.167	0.069
entranc_ntgrtd	0.256	NA			0.255	0.052
health.slope ~						
gender_intgrtd	-0.035	NA			-0.035	-0.018
choice_intgrtd	-0.077	NA			-0.077	-0.032
entranc_ntgrtd	-0.150	NA			-0.150	-0.031
ces.level ~						
gender_intgrtd	0.158	1.176	0.134	0.893	0.156	0.081
choice_intgrtd	-0.001	2.327	-0.001	1.000	-0.001	-0.001
entranc_ntgrtd	0.658	4.367	0.151	0.880	0.650	0.134
ces.slope ~						
gender_intgrtd	-0.055	9.921	-0.006	0.996	-0.055	-0.029
choice_intgrtd	-0.059	2.564	-0.023	0.982	-0.059	-0.024
entranc_ntgrtd	-0.245	40.804	-0.006	0.995	-0.244	-0.050

Covariances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1 ~~						
.ces_Mean_T1	0.142	0.029	4.940	0.000	0.142	0.224
.health_Mean_T2 ~~						
.ces_Mean_T2	0.040	0.065	0.612	0.540	0.040	0.130
.health_Mean_T3 ~~						
.ces_Mean_T3	0.175	0.035	4.979	0.000	0.175	0.328
.health_Mean_T4 ~~						
.ces_Mean_T4	0.052	0.064	0.822	0.411	0.052	0.139
.health.level ~~						
.health.slope	-0.743	20.707	-0.036	0.971	-0.743	-0.743
.ces.level	0.898	11.584	0.078	0.938	0.898	0.898
.ces.slope	-0.735	42.259	-0.017	0.986	-0.735	-0.735
.health.slope ~~						
.ces.level	-0.484	15.526	-0.031	0.975	-0.484	-0.484
.ces.slope	0.709	NA			0.709	0.709
.ces.level ~~						
.ces.slope	-0.541	51.440	-0.011	0.992	-0.541	-0.541

Intercepts:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1	2.757	0.118	23.343	0.000	2.757	2.537
.health_Mean_T2	2.967	0.172	17.235	0.000	2.967	2.916
.health_Mean_T3	2.767	0.139	19.940	0.000	2.767	2.542
.health_Mean_T4	2.769	0.144	19.203	0.000	2.769	2.763
.ces_Mean_T1	2.605	0.135	19.350	0.000	2.605	2.497
.ces_Mean_T2	2.659	0.183	14.528	0.000	2.659	2.381
.ces_Mean_T3	2.511	0.163	15.433	0.000	2.511	2.254
.ces_Mean_T4	2.393	0.156	15.319	0.000	2.393	2.205
.health.level	0.000				0.000	0.000
.health.slope	0.000				0.000	0.000
.ces.level	0.000				0.000	0.000

.ces.slope	0.000	0.000	0.000
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Variances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1	0.720	0.044	16.514	0.000	0.720	0.609
.health_Mean_T2	0.221	0.083	2.647	0.008	0.221	0.213
.health_Mean_T3	0.617	0.048	12.773	0.000	0.617	0.520
.health_Mean_T4	0.458	0.062	7.377	0.000	0.458	0.456
.ces_Mean_T1	0.552	0.037	14.906	0.000	0.552	0.508
.ces_Mean_T2	0.422	0.071	5.925	0.000	0.422	0.339
.ces_Mean_T3	0.459	0.050	9.123	0.000	0.459	0.370
.ces_Mean_T4	0.310	0.095	3.254	0.001	0.310	0.263
.health.level	1.000				0.990	0.990
.health.slope	1.000				0.998	0.998
.ces.level	1.000				0.976	0.976
.ces.slope	1.000				0.996	0.996

Group 2 [2]:

Latent Variables:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
health.level =~						
health_Mean_T1	0.508	13.145	0.039	0.969	0.434	0.377
health_Mean_T2	0.472	NA			0.404	0.376
health_Mean_T3	0.801	28.806	0.028	0.978	0.686	0.619
health_Mean_T4	0.886	32.733	0.027	0.978	0.758	0.700
health.slope =~						
health_Mean_T1	0.965	25.240	0.038	0.969	0.912	0.792
health_Mean_T2	1.196	22.860	0.052	0.958	1.130	1.051
health_Mean_T3	1.125	37.554	0.030	0.976	1.062	0.960
health_Mean_T4	1.098	39.946	0.027	0.978	1.037	0.957
ces.level =~						
ces_Mean_T1	0.572	63.116	0.009	0.993	0.622	0.555
ces_Mean_T2	0.596	79.806	0.007	0.994	0.648	0.549
ces_Mean_T3	0.878	69.158	0.013	0.990	0.955	0.834
ces_Mean_T4	1.015	65.456	0.015	0.988	1.103	0.960
ces.slope =~						
ces_Mean_T1	0.859	34.595	0.025	0.980	0.999	0.892
ces_Mean_T2	1.078	42.458	0.025	0.980	1.254	1.061
ces_Mean_T3	0.953	41.871	0.023	0.982	1.108	0.968
ces_Mean_T4	0.907	43.544	0.021	0.983	1.055	0.918

Regressions:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
health.level ~						
gender_intgrtd	0.268	0.117	2.291	0.022	0.313	0.169
choice_intgrtd	0.206	NA			0.241	0.106

entranc_ntgrtd	0.188	NA			0.219	0.087
health.slope ~						
gender_intgrtd	-0.194	NA			-0.205	-0.111
choice_intgrtd	-0.270	NA			-0.286	-0.126
entranc_ntgrtd	-0.047	NA			-0.050	-0.020
ces.level ~						
gender_intgrtd	-0.300	8.192	-0.037	0.971	-0.276	-0.149
choice_intgrtd	-0.105	0.763	-0.137	0.891	-0.096	-0.043
entranc_ntgrtd	0.077	6.344	0.012	0.990	0.071	0.028
ces.slope ~						
gender_intgrtd	0.372	7.688	0.048	0.961	0.320	0.172
choice_intgrtd	0.038	6.552	0.006	0.995	0.032	0.014
entranc_ntgrtd	0.121	11.017	0.011	0.991	0.104	0.041

Covariances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1 ~~						
.ces_Mean_T1	0.209	0.045	4.606	0.000	0.209	0.289
.health_Mean_T2 ~~						
.ces_Mean_T2	0.044	0.065	0.677	0.498	0.044	0.122
.health_Mean_T3 ~~						
.ces_Mean_T3	0.200	0.050	4.032	0.000	0.200	0.379
.health_Mean_T4 ~~						
.ces_Mean_T4	0.122	0.076	1.612	0.107	0.122	0.251
.health.level ~~						
.health.slope	-0.515	19.012	-0.027	0.978	-0.662	-0.662
.ces.level	0.689	7.121	0.097	0.923	0.768	0.768
.ces.slope	-0.519	35.968	-0.014	0.988	-0.543	-0.543
.health.slope ~~						
.ces.level	-0.268	16.988	-0.016	0.987	-0.268	-0.268
.ces.slope	0.599	4.828	0.124	0.901	0.562	0.562
.ces.level ~~						
.ces.slope	-0.740	55.920	-0.013	0.989	-0.602	-0.602

Intercepts:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1	2.710	0.085	31.891	0.000	2.710	2.353
.health_Mean_T2	2.909	0.094	30.795	0.000	2.909	2.706
.health_Mean_T3	2.716	0.108	25.254	0.000	2.716	2.453
.health_Mean_T4	2.809	0.094	29.915	0.000	2.809	2.592
.ces_Mean_T1	2.477	0.089	27.912	0.000	2.477	2.213
.ces_Mean_T2	2.582	0.101	25.469	0.000	2.582	2.184
.ces_Mean_T3	2.634	0.099	26.625	0.000	2.634	2.302
.ces_Mean_T4	2.731	0.101	27.156	0.000	2.731	2.378
.health.level	0.000				0.000	0.000
.health.slope	0.000				0.000	0.000
.ces.level	0.000				0.000	0.000
.ces.slope	0.000				0.000	0.000

Variances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1	0.836	0.068	12.285	0.000	0.836	0.631
.health_Mean_T2	0.327	0.100	3.276	0.001	0.327	0.283
.health_Mean_T3	0.604	0.062	9.812	0.000	0.604	0.492
.health_Mean_T4	0.578	0.079	7.293	0.000	0.578	0.492
.ces_Mean_T1	0.627	0.062	10.091	0.000	0.627	0.501
.ces_Mean_T2	0.397	0.113	3.528	0.000	0.397	0.284
.ces_Mean_T3	0.462	0.065	7.162	0.000	0.462	0.353
.ces_Mean_T4	0.410	0.119	3.440	0.001	0.410	0.311
.health.level	0.698	0.569	1.227	0.220	0.954	0.954
.health.slope	0.868	NA			0.972	0.972
.ces.level	1.153	9.142	0.126	0.900	0.976	0.976
.ces.slope	1.309	5.020	0.261	0.794	0.969	0.969

Group 3 [3]:

Latent Variables:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
health.level =~						
health_Mean_T1	0.508	13.145	0.039	0.969	0.594	0.533
health_Mean_T2	0.472	NA			0.552	0.472
health_Mean_T3	0.801	28.806	0.028	0.978	0.937	0.670
health_Mean_T4	0.886	32.733	0.027	0.978	1.036	0.932
health.slope =~						
health_Mean_T1	0.965	25.240	0.038	0.969	0.799	0.718
health_Mean_T2	1.196	22.860	0.052	0.958	0.991	0.847
health_Mean_T3	1.125	37.554	0.030	0.976	0.931	0.666
health_Mean_T4	1.098	39.946	0.027	0.978	0.909	0.818
ces.level =~						
ces_Mean_T1	0.572	63.116	0.009	0.993	0.769	0.679
ces_Mean_T2	0.596	79.806	0.007	0.994	0.803	0.690
ces_Mean_T3	0.878	69.158	0.013	0.990	1.182	1.010
ces_Mean_T4	1.015	65.456	0.015	0.988	1.365	1.184
ces.slope =~						
ces_Mean_T1	0.859	34.595	0.025	0.980	1.130	0.998
ces_Mean_T2	1.078	42.458	0.025	0.980	1.419	1.220
ces_Mean_T3	0.953	41.871	0.023	0.982	1.254	1.071
ces_Mean_T4	0.907	43.544	0.021	0.983	1.193	1.035

Regressions:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
health.level ~						
gender_intgrtd	0.335	NA			0.287	0.149
choice_intgrtd	0.266	NA			0.228	0.101
entranc_ntgrtd	0.204	NA			0.174	0.077

health.slope ~						
gender_intgrtd	-0.280	NA			-0.338	-0.176
choice_intgrtd	-0.361	0.161	-2.250	0.024	-0.436	-0.193
entranc_ntgrtd	-0.062	NA			-0.075	-0.033
ces.level ~						
gender_intgrtd	-0.003	0.737	-0.004	0.997	-0.002	-0.001
choice_intgrtd	0.109	10.955	0.010	0.992	0.081	0.036
entranc_ntgrtd	0.120	2.426	0.050	0.960	0.089	0.039
ces.slope ~						
gender_intgrtd	-0.017	0.920	-0.018	0.986	-0.013	-0.007
choice_intgrtd	-0.339	5.786	-0.059	0.953	-0.257	-0.114
entranc_ntgrtd	-0.127	4.013	-0.032	0.975	-0.096	-0.042
Covariances:						
	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1 ~~						
.ces_Mean_T1	0.068	0.050	1.374	0.170	0.068	0.096
.health_Mean_T2 ~~						
.ces_Mean_T2	0.136	0.088	1.546	0.122	0.136	0.286
.health_Mean_T3 ~~						
.ces_Mean_T3	0.374	0.106	3.544	0.000	0.374	0.477
.health_Mean_T4 ~~						
.ces_Mean_T4	0.014	0.143	0.098	0.922	0.014	0.039
.health.level ~~						
.health.slope	-0.460	NA			-0.501	-0.501
.ces.level	1.415	NA			0.918	0.918
.ces.slope	-0.825	77.931	-0.011	0.992	-0.550	-0.550
.health.slope ~~						
.ces.level	-0.610	NA			-0.568	-0.568
.ces.slope	0.736	3.724	0.198	0.843	0.705	0.705
.ces.level ~~						
.ces.slope	-1.273	80.775	-0.016	0.987	-0.726	-0.726
Intercepts:						
	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1	2.521	0.097	26.075	0.000	2.521	2.264
.health_Mean_T2	3.048	0.116	26.349	0.000	3.048	2.605
.health_Mean_T3	2.311	0.134	17.259	0.000	2.311	1.653
.health_Mean_T4	3.030	0.105	28.869	0.000	3.030	2.725
.ces_Mean_T1	2.904	0.095	30.526	0.000	2.904	2.563
.ces_Mean_T2	3.250	0.115	28.140	0.000	3.250	2.794
.ces_Mean_T3	3.148	0.118	26.790	0.000	3.148	2.690
.ces_Mean_T4	3.139	0.106	29.593	0.000	3.139	2.721
.health.level	0.000				0.000	0.000
.health.slope	0.000				0.000	0.000
.ces.level	0.000				0.000	0.000
.ces.slope	0.000				0.000	0.000

Variances:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
.health_Mean_T1	0.744	0.071	10.413	0.000	0.744	0.600
.health_Mean_T2	0.654	0.116	5.632	0.000	0.654	0.477
.health_Mean_T3	1.120	0.162	6.913	0.000	1.120	0.573
.health_Mean_T4	0.318	0.175	1.817	0.069	0.318	0.258
.ces_Mean_T1	0.675	0.078	8.621	0.000	0.675	0.526
.ces_Mean_T2	0.347	0.134	2.578	0.010	0.347	0.256
.ces_Mean_T3	0.550	0.104	5.263	0.000	0.550	0.401
.ces_Mean_T4	0.405	0.170	2.385	0.017	0.405	0.304
.health.level	1.316	NA			0.962	0.962
.health.slope	0.640	NA			0.933	0.933
.ces.level	1.806	23.247	0.078	0.938	0.997	0.997
.ces.slope	1.705	54.542	0.031	0.975	0.985	0.985