Diverse-and-Dynamic Pathways in Educational and Interpersonal Identity Formation during Adolescence: Longitudinal Links With Psychosocial Functioning

This is the post peer-review accepted manuscript of:

Hatano, K., Sugimura, K., Crocetti, E., & Meeus, W. (2020). Diverse-and-dynamic pathways in educational and interpersonal identity formation during adolescence: longitudinal links with psychosocial functioning. Child Development, 91(4), 1203-1218. https://doi.org/10.1111/cdev.13301

Diverse-and-Dynamic Pathways in Educational and Interpersonal Identity Formation during Adolescence: Longitudinal Links with Psychosocial Functioning

Kai Hatano

Osaka Metropolitan University

Kazumi Sugimura

Hiroshima University

Elisabetta Crocetti

Alma Mater Studiorum University of Bologna

Wim Meeus

Utrecht University

Correspondence concerning this paper should be addressed to Kai Hatano

Address: 1-1 Gakuen-cho, Naka-ku, Sakai City, Osaka 599-8531, Japan

Phone: +81-72-254-9614

E-mail: kai.hatano@omu.ac.jp

Abstract

This study aimed to examine the relations between educational and interpersonal identity trajectories and psychosocial functioning based on a three-factor identity process model. A total of 968 Japanese adolescents including 13-and 16-years-olds (49.7% female) participated in a four-wave longitudinal study. Latent class growth analysis extracted five identity trajectories in each educational and interpersonal identity domain and revealed (1) high prevalence of low commitment identity trajectories, (2) absence of the closure trajectory, and (3) changeable identity trajectories that have not been identified in Western context (i.e., the Netherlands). Furthermore, a latent change model revealed dynamic relations between identity trajectories and psychosocial functioning. These findings provide critical insights into the diverse and dynamic pathways of identity formation during adolescence in Japan.

Introduction

Identity is a key developmental task in adolescence (Erikson, 1968). Adolescents tend to explore commitment alternatives actively before deciding on their goals, values, and beliefs (Marcia, 1966; Meeus, 2011). Researchers in the field of identity have acknowledged unique identity development experiences both within individuals and across domains of identity (Galliher, McLean, & Syed, 2017). Specifically, both education and interpersonal relationships are salient identity domains for adolescents (for reviews, see Crocetti, 2017; Meeus, 2011), affecting their psychosocial functioning (i.e., subjective well-being and psychosocial problems; for a review, see van Doeselaar, Becht, Klimstra, & Meeus, 2018).

Research has underlined the importance of examining identity developmental trajectories to disentangle how adolescents develop over time their identity profiles in overall identity (Meeus et al., 2012) and in specific domains, such as educational and interpersonal identity (Becht et al., 2016). However, evidence on these aspects is limited to studies conducted in one Western context (i.e., the Netherlands; Becht et al., 2016; Meeus et al.,

2012); outside the Dutch context, the developmental trajectories in educational and interpersonal identity formation during adolescence remain unclear. Given that social and cultural factors inevitably affect the ways in which adolescents explore and choose their identity options (Dimitrova, Buzea, Taušová, Uka, Zakaj, & Crocetti, 2018; van deVijver, Breugelmans, & Schalk-Soekar, 2008), the developmental identity trajectories and their roles in adolescent psychosocial functioning may differ across national contexts (Phinney & Baldelomar, 2012). The present study addressed these issues by examining the longitudinal links between identity trajectories and psychosocial functioning (i.e., subjective well-being and psychosocial problems). We aimed to discover the diversity and dynamics in the pathways of identity formation across identity domains (i.e., educational and interpersonal) among adolescents in Japan.

Identity Processes, Trajectories, and their Associations with Psychosocial Functioning

Erikson (1968) defined identity as a dynamic interplay between identity synthesis (i.e., a clear and consistent sense of self) and identity confusion (i.e., a fragmented and inconsistent sense of self). This dynamic interplay was interpreted by Marcia (1966) as a process of exploration (i.e., active search for values, purpose, and beliefs before making choices) and commitment (i.e., choosing one identity option). Based on Marcia's concept of exploration and commitment, Meeus and Crocetti proposed a three-factor identity process model (including processes of commitment, in-depth exploration, and reconsideration of commitment) that aims to capture the dynamic process by which individuals form and change their identity over time (Crocetti, Rubini, & Meeus, 2008; Meeus, van de Schoot, Keijsers, Schwartz, & Branje, 2010). Commitment refers to enduring choices that individuals have made with regard to various developmental domains and to the self-confidence they derive from these choices. In-depth exploration refers to the extent to which individuals actively think about their identity commitment by gathering information and talking with others.

Reconsideration of commitment refers to the process of searching for another identity option when a current commitment is no longer satisfactory (Crocetti, 2018).

Five identity statuses were identified based on combinations of high or low levels of these three processes. These statuses were: achievement (high level of commitment and in-depth exploration and low level of reconsideration of commitment), closure (moderate level of commitment and low level of in-depth exploration and reconsideration of commitment), moratorium (low level of commitment and in-depth exploration and high level of reconsideration of commitment), diffusion (low level of all identity processes), and searching moratorium (high level of all identity processes) (Meeus et al., 2010). Notably, these statuses have been found across different national groups (e.g., in Italy, the Netherlands, Turkey, and Japan; for a review, see Crocetti, 2017) and longitudinally, from early to late adolescence—hereafter, we refer to these longitudinal identity statuses as identity trajectories (Meeus et al., 2012).

To grasp the identity statuses and identity trajectories, it is also important to examine their relation to psychosocial functioning considering both positive (e.g., satisfaction with life and subjective happiness) and negative aspects (e.g., internalizing and externalizing psychosocial problems). Cross-sectional studies have shown that individuals classified into high-commitment statuses (i.e., achievement, closure, and searching moratorium) score high on subjective well-being (i.e., satisfaction with life) and low on internalizing (i.e., anxiety and depression) and externalizing (i.e., aggression and delinquency) problems compared with those in low-commitment statuses (i.e., moratorium and diffusion; Crocetti et al., 2008; Crocetti, Schwartz, Fermani, Klimstra, & Meeus, 2012; Hatano, Sugimura, & Crocetti, 2016; Morsünbül, Crocetti, Cok, & Meeus, 2016). Further, adolescents in moratorium were found to report more anxiety and depression compared with those in the diffusion status (e.g., Crocetti et al., 2012; Hatano et al., 2016; see also Meeus, Iedema, Helsen, & Vollebergh,

1999). Only one longitudinal study on identity trajectories has revealed that adolescents in the achievement trajectory score lower on depression compared with those in the moratorium trajectory (Meeus et al., 2012). These results suggest that individuals who do not have strong identity commitments are less adaptive to stress or life challenges compared with individuals who have strong commitments.

A Domain-Specific Approach in Identity Processes

Identity research has focused on identity processes from a general perspective; however, identity researchers using the Meeus–Crocetti model have recently turned their attention to the importance of different experiences in identity formation across domains (e.g., Becht et al., 2016; Karaś & Cieciuch, 2018; Klimstra et al., 2010; Pop, Negru-Subtirica, Crocetti, & Meeus, 2016; Vosylis, Erentaite, & Crocetti, 2018). Examining identity across domains is critical for a precise understanding of identity development, as adolescents with a strong sense of commitment in one domain may not necessarily demonstrate the same in another domain (Crocetti, Scrignaro, Sica, & Magrin, 2012; Goossens, 2001; Luyckx, Seiffge-Krenke, Schwartz, Crocetti, & Klimstra, 2014). This approach, which is domain-specific, does not focus on general identity but instead examines separate (i.e., educational and interpersonal) identity domains (Goossens, 2001; Karaś & Cieciuch, 2018).

Among the identity domains, educational and interpersonal (i.e., friendship) identity have been found to be particularly salient in adolescents (Crocetti, 2017; Meeus, 2011). The process of identity formation may differ between educational and interpersonal domains, as these domains are different because of their relatively "closed" and "open" nature (Meeus et al., 1999). Specifically, for adolescents, it is difficult to influence the external constraints imposed by educational settings; meanwhile, it is feasible to explore new friendships freely (e.g., Albarello, Crocetti, & Rubini, 2018). These arguments imply that educational identity is less changeable compared with interpersonal identity because the state of identity tends to be

imposed by the environment. Further, the associations between identity trajectories and psychosocial functioning may differ between the educational and interpersonal domains. For instance, Becht and colleagues (2016) revealed in a daily diary study that educational identity is more strongly related to school anxiety compared with interpersonal identity, whereas interpersonal identity formation is more strongly associated with perceived support from best friends compared with educational identity.

So far, research has not identified separate educational and interpersonal identity trajectories based on all three identity processes (i.e., commitment, in-depth exploration, and reconsideration of commitment), nor examined how these educational and interpersonal identity trajectories are intertwined with psychosocial functioning in adolescence. Meeus and colleagues (2012) identified identity trajectories based on the three identity processes, but focused on identity at a global level. Becht and colleagues (2016) identified daily identity formation processes focusing on two identity processes (i.e., commitment and reconsideration of commitment) with a single item measure of each of these identity processes in the educational and interpersonal domains. As these previous studies have focused on Dutch adolescents, it is unclear whether identity trajectories exist during adolescence outside the Dutch context. Thus, research on identity trajectories in the educational and interpersonal domains among adolescents based on three identity processes is lacking. To overcome these limitations, we extracted the educational and interpersonal identity trajectories and then examined the associations between these identity trajectories and psychosocial functioning during adolescence in Japanese adolescents.

Identity Development in the Japanese Context

In Japan, school is particularly important as a context of educational and interpersonal identity development in adolescence. First, similar to other post-industrial countries (e.g., the United States), the period of adolescence is prolonged in Japan (Arnett, Žukauskienė, &

Sugimura, 2014); thus, the youth spend most of the time in school during adolescence (Ministry of Health, Labour, and Welfare, 2009). Education is compulsory from elementary through junior high school, and 98.7% of junior high school students attend high school. Further, most high school students attend tertiary education: 54.8%, 16.0%, and 5.4% subsequently enroll in university (or junior college), vocational school, and specialized training college, respectively, and 17.5% enter the labor market; 6.3% take other paths (Statistics Bureau of Japan, 2018). Adolescents aged 15 years have the opportunity to make a decision on their educational career. However, because the vast majority of them enroll in tertiary education at the age of 18 years, many adolescents until then are demanded to focus on the education they currently receive and on the preparation for their entrance examination for tertiary education.

Second, individuals are strongly demanded to adapt to the norms of the school to which they belong and their studies. Specifically, Japanese adolescents believe that receiving a higher education guarantees one's success in life, with success meaning landing a permanent job in a company with a seniority wage system, which is thought to be an ideal career in Japan (National Institution for Youth Education, 2015; see also Sugimura & Mizokami, 2012). Indeed, university graduates have more opportunities to highly paid jobs compared with high school graduates (Ministry of Health, Labour and Welfare, 2016).

Third, people tend to make close interpersonal relationships with friends and colleagues within the institution and to construct strong emotional ties with them (Brinton, 2011). Thus, for Japanese adolescents, their relationship with friends largely means their relationship with schoolmates and classmates. Indeed, 94% of junior high school students and 90% of the high school students have their best friends in school, not outside the school (Cabinet Office, 2010). Additionally, class members are typically rearranged at the beginning of each academic year; this makes Japanese adolescents even more nervous of the issue of

making friends in school or the classroom. Overall, Japanese adolescents are required to adjust their interests to their education (i.e., work hard on studying) and to care much about friendships within the school (i.e., getting along with classmates).

Considering this situation, the educational identity trajectory could be stable among most Japanese adolescents because it is difficult for them to exert an effect on the external constraints imposed by the educational setting; this is similar to the situation of Dutch adolescents (Meeus et al., 1999). Further, some adolescents may develop their identity in an adaptive manner because they try to acclimatize to their current educational environment and because some of them explore alternative options of higher education when preparing for their college entrance examination. In terms of interpersonal identity, as the Japanese context demands adolescents to find their best friends within the school, they could build a high-quality relationship with them when they are successful at making best friends there; meanwhile, adolescents could have difficulty making close friends throughout their school life when they fail to establish friendships in school (Cabinet Office, 2010). In addition, classmates who have fixed their schedules to take most of their classes together are rearranged every year in the Japanese school system. Therefore, Japanese adolescents need to continually reconstruct their friendships according this class change. We expected to identify some fluctuating trajectories in the friendship domain.

The relation of identity trajectories with psychosocial functioning could also reflect such characteristics of the Japanese context. Owing to the strong pressure for study and relationship with peers at school, both educational and interpersonal identity trajectories might have a strong impact on adolescent psychosocial functioning. Indeed, studying and making friends are important interests for junior and high school students (Ministry of Health, Labour, and Welfare, 2016). Therefore, it is worth examining how the educational and interpersonal identity trajectories affect psychosocial functioning over time in Japanese

adolescents.

The Present Study

In line with the current state of research on identity and psychosocial functioning, the first aim of this study was to reveal the profile of educational and interpersonal identity trajectories based on the three-factor identity model (Crocetti et al., 2008). For both educational and interpersonal identity trajectories, we hypothesized that five identity trajectories (i.e., achievement, closure, moratorium, diffusion, and searching moratorium) would be identified. Cross-sectional research on Japanese youth using the three-factor identity model in the global domain has identified five identity statuses (i.e., achievement, closure, moratorium, diffusion, and searching moratorium). Regarding the educational identity trajectories, we expected that progressive identity trajectories (e.g., diffusion to moratorium or moratorium to achievement trajectory) would be identified; some adolescents may acclimatize to their current educational setting or change their mind toward the next educational environment (e.g., high school for junior high school students and university for high school students). As for the interpersonal identity trajectories, we expected that changeable identity trajectories (i.e., progressive, regressive, or fluctuating trajectories) would be identified because adolescents have to reconstruct their friendship according to the "class change" in each grade. Further, in both the educational and interpersonal domains, we expected a high prevalence of moratorium trajectories compared with the other trajectories during adolescence. As Japanese adolescents tend to choose their career at around the age of 20–24 years (i.e., when finishing tertiary education), they may regard the period of being junior or high school students as a time for exploring their educational and interpersonal identity. Regarding the associations between educational and interpersonal identity trajectories, following the prior proposition and findings in a domain-specific approach (i.e., low congruences in identity statuses across domains; Crocetti, Scrignaro et al., 2012;

Goossens, 2001; Luyckx et al., 2014), we expected that not all of the participants would belong to same types of identity trajectories. We also expected that the ratios of these identity trajectories would not differ between age group (13–16 years vs. 16–19 years age group) and region (urban vs. rural). In Japan, the school environment is similar both in junior and high schools (i.e., demanding students to study hard to prepare for their college entrance examination and to get along with classmates), and thus, this situation can be viewed as common throughout adolescence and across regions.

The second aim of this study was to examine the relation between identity trajectories and psychosocial functioning. Research has indicated that those with high-commitment identity statuses (i.e., achievement, closure, and searching moratorium; e.g., Meeus et al., 2012; Morsünbül et al., 2016) score high on subjective well-being and low on psychosocial problems compared with low-commitment identity statuses (i.e., moratorium and diffusion; Crocetti et al., 2008; Hatano et al., 2016; Meeus et al., 2012; Morsünbül et al., 2016). Further, individuals in diffusion status tended to lack future purpose and exhibit a lower level of feeling of happiness compared with those in other statuses (Kroger & Marcia, 2011). Meanwhile, individuals in a moratorium status tended to engage in an excessive amount of explorations and even risky behaviors, preoccupied with the search for their future purpose, values, and beliefs (Marcia, 1966). Given these prior findings, we hypothesized that high-commitment trajectories would be positively associated with subjective well-being and negatively associated with psychosocial problems. We also expected that being in the moratorium status would be positively linked to psychosocial problems, and that the diffusion status would be negatively associated with subjective well-being. We further hypothesized differences in the relation of identity trajectories with psychosocial functioning across domains. Adolescents in Japan believe that receiving a higher education guarantees an individual's success in life (e.g., National Institution for Youth Education, 2015).

Additionally, similar to the case in other countries (e.g., Siennick & Staff, 2008, for the United States; see also, Mercer, Crocetti, Branje, van Lier, & Meeus, 2017), adolescents with poorer academic achievement are likely to engage in delinquent behaviors (Cabinet Office, 2010). Based on these arguments and findings from extant evidence, we hypothesized that educational identity would significantly relate to satisfaction with life (i.e., cognitive components of subjective well-being) and externalizing problems (i.e., delinquent behavior and problematic conduct) compared with the interpersonal identity trajectories. We also expected that interpersonal identity trajectories would relate to subjective happiness (i.e., emotional component of subjective well-being) compared with the educational trajectories, given that adolescents in Japan tend to make close interpersonal relationships with friends and colleagues within the school and to construct strong emotional ties to them (Brinton, 2011).

Method

Participants

Data were obtained from the Japanese Longitudinal Identity Research Project (Hatano & Sugimura, 2017; Hatano et al., 2016, 2017), which consisted of four waves conducted from March 2013 to March 2016 with one-year assessment intervals. We matched the time interval with that in previous identity trajectory research (i.e., Meeus et al., 2012). In the first wave (T1), participants were 1,233 Japanese adolescents aged either 13 or 16 years; these participants were followed until they were ages 16 or 19 years, respectively. At T1, both groups (i.e., the 13- and 16-year-olds) were first-graders in three-year junior high schools and high schools, respectively. Both age groups experienced the school-to-school or school-to-work transitions between the third and fourth waves (i.e., between T3 and T4; participants in each group were 15 and 18 years old, respectively). In the present sample, at T4, 94.8% of the 16-year-old participants attended high school, and 5.1% were in either permanent or non-

permanent employment. At T4, 75.9 % of the 19-year-old participants attended junior college, university, or vocational school, whereas 21.1% were in either permanent or non-permanent employment.

At T2, T3, and T4, 885, 733, and 424 participants provided data, respectively. We analyzed only the data of participants who provided information for at least two time points to ensure that we obtained reliable and valid individual estimates of linear slopes (Shaw, Gilliom, Ingoldsby, & Nagin, 2003). This resulted in a final sample of 968 adolescents (78.5% of the original sample), of whom 49.3% were the 13–16-year-old participants. Overall, 21.5% of the data were missing. We used Little's (1988) Missing Completely at Random test to examine missing data. We obtained a non-significant χ^2 value for this test, $\chi^2(111) = 120.3346$, $p = .256$, suggesting that missing values could be reliably estimated. We employed the full information maximum likelihood procedure in Mplus 7.2 (Muthén & Muthén, 1982–2012).

Procedure

Data were collected using an online research company (MACROMILL: http://www.macromill.com/), which works with a variety of registrants from around the world. At the initiation of a survey, the company sends an e-mail to each registrant matching the researchers' request. Registrants may then choose to participate in the survey or decline. All of the present participants were registered with the company. For the present research, the requests were defined as follows: (1) of Japanese nationality, (2) recruited throughout Japan, and (3) contributed to our goal of recruiting approximately 600 participants in each age group (i.e., 13- and 16-year-olds). Thirteen- and 16-year-olds did not register for the research company themselves; therefore, the survey targets were parents with children of these ages. Participants matching these requests received an e-mail describing the study's purposes and the parents or guardians signed an informed consent agreement if they wanted their children

to participate. After providing consent, participants received an e-mail containing a hyperlink to the web-based survey. Participants received reward points equivalent to 50 JPY (approximately .50 USD) for completing the questionnaire. Seventy-two percent of the participants lived in the Kanto, Chubu, and Kinki metropolitan districts (i.e., urban areas in eastern, central, and mid-western Japan, respectively). The remaining participants lived in the Hokkaido, Tohoku, Chugoku, Shikoku, and Kyushu districts (i.e., relatively rural areas).

Measures

Identity processes. We assessed identity commitment, in-depth exploration, and reconsideration of commitment at each time point (T1–T4) using the Utrecht-Management of Identity Commitments Scale (U-MICS; Crocetti et al., 2008; for the validation of the Japanese version, see Crocetti et al., 2015; Hatano et al., 2016). This measure consists of 13 items rated on a 5-point Likert scale ranging from 1 (*completely untrue*) to 5 (c*ompletely true*). In this study, educational and interpersonal identity domains were considered. Sample items are as follows: "My education/best friend gives me certainty in life" (commitment, 5 items for each domain); "I think a lot about my education/best friend" (in-depth exploration, 5 items for each domain); and "I often think it would be better to try to find a different education/best friend" (reconsideration of commitment, 3 items for each domain). Across the four waves, Cronbach's alpha values respectively ranged from .89 to .90 and from .82 to .84 for educational and interpersonal commitment; from .87 to .89 and from .87 to .88 for educational and interpersonal in-depth exploration; from .85 to .86 and from .71 to .80 for educational and interpersonal reconsideration of commitment.

Subjective well-being. We assessed subjective well-being at the beginning and the end of the study (T1 and T4) using two instruments. First, we measured life satisfaction using the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985; for the Japanese version, see Kadono, 1994). This scale consists of five items scored on a 5-point

Likert scale ranging from 1 (*completely untrue*) to 5 (*completely true*). A sample item is "In most ways, my life is close to my ideal." Second, we assessed subjective happiness using the Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999; for the Japanese version, see Shimai, Otake, Utsuki, Ikemi, & Lyubomirsky, 2004). This scale consists of four items scored on a 5-point Likert scale ranging from 1 (*completely untrue*) to 5 (*completely true*). A sample item is "Compared with most of my peers, I consider myself happy." Cronbach's alpha values at T1 and T4 for SWLS were .84 and .90, and for SHS, .66 and .66, respectively.

Psychosocial problems. We assessed internalizing and externalizing problems at T1 and T4 using four subscales of the Strengths and Difficulties Questionnaire (Goodman 1997; for the Japanese version, see Sugawara Sakai, Sugiura, & Matsumoto, 2006). Participants rated 20 items on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Items for internalizing problems represented (a) emotional symptoms (i.e., mood of depression and anxiety; 5 items, e.g., "I worry a lot") and (b) peer problems (i.e., feeling of loneliness based on peer trouble; 5 items, e.g., "Other children or young people pick on me or bully me"). Items for externalizing problems included (c) conduct problems (i.e., antisocial behaviors; 5 items, e.g., "I am constantly fidgeting or squirming") and (d) hyper activity (i.e., inattention deficit and hyper activity; 5 items, e.g., "I am easily distracted; I find it difficult to concentrate"). Cronbach's alpha values at T1 and T4 for internalizing problems were .80 and .84, and for externalizing problems, .78 and .83, respectively.

Statistical Analysis

To examine the association among identity trajectories, subjective well-being, and psychosocial problems, the present analyses proceeded in four steps. First, we conducted the longitudinal invariance analysis to confirm that the three-factor model of the U-MICS was equivalent across time. Second, to examine general trends in identity development trajectories, we used Latent Growth Curve Modeling (LGCM; Duncan, Duncan, Strycker, Li,

& Alpert, 1999). LGCM provides both mean levels (i.e., intercepts) and mean change rates (i.e., slopes) based on individual growth trajectories. Third, to extract the identity trajectories, we used Latent Class Growth Analysis (LCGA; Nagin, 2005). LCGA is a combined variable-centered and person-centered approach that summarizes longitudinal data by modeling individual-level variability in developmental trajectories through a small number of classes set by inter-individual differences (intercepts) and intra-individual differences (slopes; Nagin, 2005). Additionally, we compared the prevalence for the trajectories between the13–16 and 16–19 age groups and between urban and rural groups. Fourth, we examined the associations among the class probabilities in identity trajectories, subjective well-being, and psychosocial problems. Regarding subjective well-being and psychosocial problems, we constructed a latent change model on waves 1 to 4 (McArdle & Nesselroade, 1994). Latent change model analysis is a promising technique that allows for modeling of complex patterns of development and change of multiple developmental processes simultaneously (e.g., Jackson & Allemond, 2014). In this model, we examined the associations among identity trajectories in both domains as well as the intercepts (i.e., levels) and the slopes (i.e., changes) of subjective well-being and psychosocial problems. Detailed information regarding the strategy of analysis and the criteria of model fit are presented in the supplementary materials (Appendix SA and SB, respectively).

Results

Preliminary Analysis

Results of longitudinal invariance tests clearly highlighted that all hierarchical levels of invariance (configural, metric, and scalar) could be established (Table 1). Means, standard deviations, and correlations among identity processes, subjective well-being, and psychosocial problems are presented in the supplementary materials (Tables S1 and S2). Further, we ran six LGCM analyses for each domain and each identity process. The results

are presented in Table 2. All LGCM models provided acceptable data fit. In the educational domain, all identity processes increased linearly over time. In the interpersonal domain, commitment increased linearly over time. Commitment in both educational and interpersonal domains were negatively curved over time.

Identity Trajectory Classes

To extract the identity trajectories, LCGAs were conducted separately for the educational and interpersonal domains. Based on all of the criteria, we selected a five-class solution to maintain parsimony in both the educational and interpersonal identity domains (Table 3). Table 4 present estimates of the mean intercepts, slopes, and quadratic slopes for all trajectory classes.

In both educational and interpersonal domains (Figures 1 and 2), the profile of three out of four identity trajectories were similar. Class 1 (6.2 % of participants in the educational domain and 4.3 % of participants in the interpersonal domain) consisted of individuals scoring relatively high on commitment and in-depth exploration and low on reconsideration of commitment. This class was interpreted as the achievement trajectory. Class 2 (18.6 % of participants in the educational domain and 20.6 % of participants in the interpersonal domain) consisted of individuals scoring relatively high on all identity processes. This class was interpreted as the searching moratorium trajectory. Class 3 (55.5% of participants in the educational domain and 59.3% of participants in the interpersonal domain) consisted of individuals scoring moderately on all identity processes; they had a slightly higher score on reconsideration of commitment compared to scores on commitment and in-depth exploration. This class was interpreted as the moratorium trajectory.

As for classes 4 and 5, the mean trends of identity processes differed across domains. In the educational domain, class 4 (12 % of participants) consisted of individuals scoring relatively low on all identity processes. This class was interpreted as the diffusion trajectory.

Class 5 (7.7 % of participants) consisted of individuals scoring moderately low on all identity processes. Additionally, scores of all identity processes further increased. We interpreted this trajectory as moving from diffusion to moratorium (D to M). In the interpersonal domain, in class 4 (9.7 % of participants) all identity processes increased but then decreased. Therefore, this trajectory was interpreted as a diffusion–moratorium–diffusion trajectory (D–M–D).

Class 5 (6.1 % of participants) consisted of individuals scoring moderately low on all identity processes. Additionally, all identity processes further decreased and then, increased. We interpreted this trajectory as moving from moratorium–diffusion–moratorium (M–D–M). Figures 1 and 2 show the estimates of the grows of three identity processes obtained across T1-T4 for the five-class solution.

To examine the relationships between the educational identity trajectories and the interpersonal identity trajectories, we conducted a chi-square test. Findings indicated significant associations among the educational identity trajectories and the interpersonal identity trajectories, χ^2 (16, N = 968) = 32.63, p < .001, Cramer's V = .288, p < .001. To determine the degree of discrepancy between expected and observed values for each cell, we calculated adjusted standardized residuals (ASRs), which can be interpreted like a z-score (ASR ≥ |1.96|; p < .05). Table 5 indicates that individuals were more likely to be assigned to the same types of identity trajectories (i.e., achievement, searching moratorium, and moratorium) or similar types of identity trajectories (i.e., D to M, D−M−D, and M−D−M) in both educational and interpersonal domains.

Furthermore, chi-square tests were used to determine if the distribution of identity trajectories differed according to age group (13–16 years vs. 16–19 years age group) and regional differences (urban vs. rural). Distribution did not significantly differ between the age groups (educational identity; χ^2(4, N = 968) = 2.383, p = .585, Cramer's V = .054, p = .585;

interpersonal identity; $\chi^2(4, N = 968) = 1.583$, $p = .812$, Cramer's $V = .040$, $p = .812$) and the regions (educational identity; $\chi^2(4, N = 968) = 9.034$, $p = .060$, Cramer's $V = .097$, $p = .060$; interpersonal identity; $\chi^2(4, N = 968) = 3.977$, $p = .409$, Cramer's $V = .064$, $p = .409$).

Relations among Identity Trajectories, Subjective Well-being, and Psychosocial Problems

To determine the associations among identity trajectories, subjective well-being, and psychosocial problems, we used structural equation modeling. The models for educational (CFI = .928–.930; RMSEA = .045–.046) and interpersonal (CFI = .928–.930; RMSEA = .045–.046) identities fit the data well. Detailed information of analysis is shown in the supplemental Table S3. Table 6 shows the correlations between class probabilities and latent factors (i.e., levels and changes) for subjective well-being and psychosocial problems.

In the educational identity domain, the class probabilities of identity trajectories were positively and negatively related to the *level* of psychosocial functioning. Specifically, the class probabilities of achievement and searching moratorium were positively related to the levels of satisfaction with life and subjective happiness and negatively related to those in internalizing and externalizing problems. The class probability of moratorium was positively related to the level of internalizing and externalizing problems. The class probabilities of diffusion and D to M were negatively associated with the levels of satisfaction with life and subjective happiness. As for the associations between identity trajectories and the *change* in psychosocial functioning, the class probability of moratorium was negatively related to the changes in satisfaction with life and subjective happiness. The class probability of diffusion was negatively related to the change in externalizing problems. The class probability of D to M was positively related to the changes in satisfaction with life and subjective happiness.

In the interpersonal identity domain, regarding the association between the identity trajectories and the *level* of psychosocial functioning, the class probability of achievement

was positively associated with the levels of subjective happiness, and negatively related to those of internalizing and externalizing problems. The class probability of searching moratorium was positively associated with the levels of satisfaction with life and subjective happiness, and negatively related to the level of internalizing problems. The class probability of moratorium was negatively related to the level of subjective happiness, and positively associated with the levels of internalizing and externalizing problems. The class probability of D–M–D was negatively related to the levels of satisfaction with life and subjective happiness, and that of M–D–M was positively related to the level of internalizing problems. Regarding the relationships between the class probabilities in identity trajectories and the *change* in psychosocial problems, the class probabilities of achievement and D–M–D were negatively related to the change in externalizing problems. The class probability of M–D–M was negatively related to the change in subjective happiness.

Discussion

Identity plays an important role in promoting or hampering the psychosocial functioning of adolescents (Klimstra & van Doeselaar, 2017; Meeus, 2011). However, longitudinal and domain-specific identity trajectory research considering multiple identity processes is lacking, especially outside of the Dutch national context. The present study aimed to reveal the identity trajectories in the educational and interpersonal domains, as well as the ways in which identity trajectories relate to subjective well-being and psychosocial problems in Japanese adolescents. Five identity trajectories were identified in both the educational and interpersonal domains. In the educational domain, four of five identity trajectories were stable (i.e., achievement, moratorium, diffusion, and searching moratorium), whereas one trajectory was transitional (D to M). In the interpersonal domain, three of five identity trajectories were stable (i.e., achievement, moratorium, and searching moratorium),

whereas two trajectories were fluctuating (i.e., M–D–M and D–M–D).

Next, we examined the associations among the class probabilities in identity trajectories and the development of subjective well-being and psychosocial problems. High-commitment identity trajectories (i.e., achievement and searching moratorium) were positively related to the initial level and change in subjective well-being, and negatively related to the initial level and change in psychosocial problems. We found the opposite pattern for low-commitment identity trajectories (i.e., moratorium, diffusion, and D–M–D).

Overall, this study contributes to the present understanding of domain-specific identity development and points to the importance of the associations of identity trajectories with psychosocial functioning in Japanese adolescents.

Identity Trajectories in Educational and Interpersonal Domains

The majority of our participants were classified into stable identity trajectories (i.e., 88% in the educational domain and 76.5% in the interpersonal domain). Thus, if the adolescent had a high sense of commitment in T1, the states would continue to T4 (i.e., achievement and searching moratorium trajectories); if the adolescent had a low sense of commitment, the states would continue to T4 (i.e., moratorium and diffusion trajectories), in both educational and interpersonal domains. Thus, the first year in junior high and high school is important for adolescents as a time for developing a sense of educational and interpersonal commitment. Parents, teachers, and counselors therefore need to pay attention to the first year in supporting the educational and interpersonal identity of adolescents.

Our results also revealed two types of changeable trajectories: one progressive trajectory in the educational domain (i.e., D to M) and two fluctuating trajectories in the interpersonal domain (i.e., M–D–M and D–M–D). Adolescents in the D to M trajectory in the educational domain appeared to not commit initially and instead explore their educational issues; then, they tended to move to explore their educational plans or goals. Such results

may reflect the fact that adolescents in Japan are typically urged to make decisions about their careers (i.e., choosing the next academic path or searching for a job) by teachers and parents when they are close to their graduation from junior high or senior high schools. Thus, their attitude toward educational identity transforms from passive to active when their graduation is approaching. In Japan, adolescents typically make decisions about their next academic path or future career when they are close to their graduation from junior high or senior high school. Toward graduation, they may be urged to explore options of educational commitment in the next educational setting.

Switching to the interpersonal domain, two fluctuating trajectories (i.e., M–D–M and D–M–D) drew the curve in the middle points (i.e., T2 and T3) and then reached back to the same identity status (i.e., the status in T1) in T4. Specifically, the adolescents in the D–M–D trajectory were characterized by an attempt to escape from diffusion and the failure to do so. Meanwhile, the adolescents in the M–D–M trajectory attempted to be rid of the identity crisis and failed to do so. These findings imply that these adolescents struggled to commit and tended to feel an identity crisis in the interpersonal domain over time. As Japanese students tend to make friends in their class, which changed at the start of a new grade, adolescents had to make new friends in every academic year. Therefore, some of the adolescents in this study might reveal such fluctuating identity formation processes in the interpersonal domain.

In line with our hypothesis, in both educational and interpersonal domains, the percentage of the type of moratorium trajectories (searching moratorium and moratorium trajectories) was rather high (i.e., approximately 80% in both domains) compared with the other identity trajectories, whereas the percentage of achievement trajectories were low (i.e., 6.2% in education and 4.3% in friendship). This markedly contrasted the findings of the research with Dutch adolescents. Meeus and colleagues (2012), focusing on the global domain, reported that approximately 60% of the Dutch adolescents were in high-commitment

statuses (achievement or closure), and the adolescents in the searching moratorium status disappeared with time. Thus, Dutch adolescents seemed to learn that there is no longer a need to look for alternative commitments near the end of adolescence. This may reflect the fact that adolescents in the Netherlands have to choose a specific curricular profile at around 14–15 years old (Becht et al., 2016). In contrast, Japanese adolescents remain uncertain, or open, regarding their commitments during adolescence, which might be making it harder for them to find a secure identity. These findings indicate that Japanese adolescents may regard the period of being junior or high school students as the time for exploring their educational and interpersonal identity because they tend to choose their career at around 20–24 years old (i.e., when finishing tertiary education).

Although a cross-sectional study using global domain has identified the closure status among Japanese youth (Hatano et al., 2016), it is intriguing that we did not identify the closure trajectory, which is characterized by consolidated commitment and low reconsideration, in both educational and interpersonal domains. This result may reflect the characteristics of the Japanese school setting. As discussed earlier, many adolescents in Japan choose their career right before finishing tertiary education, and hence, junior or high school students are likely in the middle of exploring their educational and interpersonal identity. Our sample experienced school transition between T3 and T4, and additionally, schools normally reorganize class rosters in a one-year interval. In the situation where there is no clear endpoint of exploration for both education and friendships, adolescents are likely to recognize that the education as well as friendships they currently have would not last. Therefore, it may be difficult for Japanese adolescents to continue committing to the particular educational and interpersonal option over time.

Regarding the associations of identity trajectories across domains, the majority of adolescents tended to stay in the same (i.e., achievement, searching moratorium, and

moratorium) or similar (i.e., D to M, D−M−D, and M−D−M) identity trajectories, but those adolescents who belonged to the diffusion trajectory in the educational domain tended to be classified into the other types of identity trajectories in the interpersonal domain (i.e., achievement, D−M−D, and M−D−M). This result supports the proposition and findings that adolescents with a strong sense of commitment in one domain may not necessarily demonstrate the same in another domain (Crocetti, Scrignaro et al., 2012; Goossens, 2001; Luyckx et al., 2014).

There were no significant differences among identity trajectories across ages and regions. The school setting in which adolescents are required to adjust to the school culture (i.e., studying hard and getting along with classmates) is similar for junior high and high schools and across regions in Japan. Our findings suggest that educational and interpersonal identity develop in a similar manner regardless of age group (i.e., junior high or high school) and region (i.e., urban or rural) in Japan.

In sum, adolescence is a time of psychosocial moratorium for most Japanese youth, both in the educational and interpersonal domains. In this life period, identity development embraces such diverse and dynamic pathways among adolescents within a school context that demands them to focus intensely on studying and making friends.

Disentangling Associations among Identity Trajectories, Subjective Well-Being, and Psychosocial Problems

In both educational and interpersonal domains, as hypothesized, the class probabilities in high-commitment trajectories (i.e., achievement and searching moratorium) were positively related, whereas those of diffused trajectories (i.e., diffusion and D to M in the educational domain, and D–M–D in the interpersonal domain) were negatively related to subjective well-being. Moreover, the class probabilities in high-commitment trajectories were

negatively related, whereas those in moratorium trajectories (i.e., moratorium and D–M–D) were positively related to psychosocial problems in both educational and interpersonal domains. These findings indicate that adolescents with a strong sense of commitment feel satisfaction with life and happiness, whereas those without a strong sense of commitment feel less content with their lives and are less happy (Kroger & Marcia, 2011).

Despite these similarities across identity domains, we also found differences in the relations among identity trajectories, subjective well-being, and psychosocial problems across domains. Specifically, although the class probability in the educational achievement trajectory was positively related to the intercept in satisfaction with life, that in the interpersonal achievement trajectory was not. Further, the intercept in externalizing problem showed a negative relation to the class probability in the educational searching moratorium trajectory but not to the class probability in the interpersonal searching moratorium trajectory. These results mean that educational identity trajectories may significantly promote or hamper psychosocial functioning compared with the interpersonal identity trajectories. In other words, exploring and committing to an educational identity may be more likely to intertwine with satisfaction with life and externalizing problems. This may reflect the fact that adolescents with poorer academic achievement are likely to engage in delinquent behaviors in Japan (Cabinet Office, 2010) and in other countries (Siennick & Staff, 2008). It is also particularly salient in Japan that adolescents believe that high academic career ensures success in later life (e.g., National Institution for Youth Education, 2015). Therefore, our findings provide evidence that the educational identity domain may have a strong impact on adolescents' satisfaction with life and externalizing problems within a society where an academic career is highly valued and, indeed, strongly linked to a high-paying job. The results of the interpersonal domain that those adolescents who reconsidered best friends (i.e., moratorium trajectory) felt less subjective happiness may reflect a contextual characteristic in

Japan—people tend to make close interpersonal relationships with friends and colleagues within the institution and construct strong emotional ties to them (Brinton, 2011). Hence, interpersonal identity might be related to the emotional (i.e., subjective happiness) rather than the cognitive aspects (i.e., satisfaction with life) of subjective well-being.

Limitations and Future Directions

This study is not without limitations. First, our study examined only Japanese adolescents. As such, this is a first attempt to identify identity trajectories in a non-Western cultural context. Nonetheless, research should test the replicability of the present results in other non-Western countries and in different demographic groups of adolescents. Second, the attrition rate of participants in the present longitudinal study was high. This may be due to minimal compensation (i.e., 50 JPY) for participants, though this amount was typical in the context of research in Japan. In future studies, it is important to formulate a plan for incentivizing retention in a longitudinal study. Third, regarding the indices of psychosocial functioning, the present study used only two measurement points (i.e., T1 and T4); thus, we were not able to examine their non-linear changes. It will be important for future studies to include data from three or more waves to test if our results can be replicated by using latent growth curve modeling (Duncan et al., 1999). Finally, in this study, we focused on the educational and interpersonal domains, since these domains are assumed to be crucial for adolescents (Meeus, 2011). Although we believe that these domains are salient to Japanese adolescents, it is unclear whether or not there are other important domains that are relevant for this group. Future research should include other identity domains (e.g., religion: Sugimura et al., 2018) to facilitate a better understanding of identity integration in relation to the view of the self in Japanese contexts.

Conclusion

Despite these limitations, this study contributes substantially to the knowledge of

diverse pathways of educational and interpersonal identity formation that are interconnected with psychosocial functioning. While previous research focused on identity trajectories in the global domain, this study examined identity trajectories in specific domains (i.e., educational and interpersonal domains). We were able to reveal that the process of identity formation among adolescents in Japan may last longer and embrace a more fluctuated feature than in peers in other cultural contexts (e.g., the Netherlands). Furthermore, we were able to unravel the associations between identity trajectories and subjective well-being and psychosocial problems. Our findings illuminate the characteristics of each identity trajectory and suggest that identity trajectories play important roles in promoting and hampering psychosocial functioning. We encourage researchers to pay further attention to domain-based identity research and to advance knowledge regarding how identity develops during adolescence all over the world.

Reference

Albarello, F., Crocetti, E., & Rubini, M. (2018). I and us: A longitudinal study on the interplay of personal and social identity in adolescence. *Journal of Youth and Adolescence, 47*, 689-702. doi:10.1007/s10964-017-0791-4

Arnett, J. J., Žukauskienė, R., & Sugimura, K. (2014). The new life stage of emerging adulthood at ages 18–29 years: Implications for mental health. *Lancet Psychiatry*, 1, 569–576. doi:10.1016/S2215-0366(14)00080-7

Becht, A. I., Nelemans, S. A., Branje, S. J. T., Vollebergh, W. A. M., Koot, H. M., Denissen, J. J. A., & Meeus, W. H. J. (2016). The quest for identity in adolescence: Heterogeneity in daily identity formation and psychosocial adjustment across 5 years. *Developmental Psychology, 52*, 2010-2021. doi:10.1037/dev0000245

Brinton, M, C. (2011). *Lost in transition: Youth, work, and instability in postindustrial Japan*. New York, NY: Cambridge University Press.

Cabinet Office (2010). *Dai yonkai hikou geiin ni kansuru sougouteki kenkyuu chosa* [The research survey about the reason for delinquent behavior]. Retrieved from https://www8.cao.go.jp/youth/kenkyu/hikou4/html/html/2-1-2.html

Crocetti, E. (2017). Identity formation in adolescence: The dynamic of forming and consolidating identity commitments. *Child Development Perspectives*, *11*, 145-150. doi:10.1111/cdep.12226

Crocetti, E. (2018). Identity dynamics in adolescence: Processes, antecedents, and consequences. *European Journal of Developmental Psychology*, *15*, 11-23. doi:10.1080/17405629.2017.1405578

Crocetti, E., Cieciuch, J., Gao, C. H., Klimstra, T., Lin, C. L., Matos, P. M., Morsünbül, Ü., Negru, O., Sugimura, K., Zimmermann, G., & Meeus, W. H. J. (2015). National and gender measurement invariance of the Utrecht-Management of Identity Commitments Scale (U-MICS): A ten-nation study. *Assessment*, *22*, 753-768. doi:10.1177/1073191115584969

Crocetti, E., Scrignaro, M., Sica, L. S., & Magrin, M. E. (2012). Correlates of identity configurations: Three studies with adolescent and emerging adult cohorts. *Journal of Youth and Adolescence*, 41, 732-748. doi:10.1007/s10964-011-9702-2

Crocetti, E., Schwartz, S., Fermani, A., Klimstra, T., & Meeus, W. H. J. (2012). A cross-national study of identity statuses in Dutch and Italian adolescents: Status distributions and correlates. *European Psychologist*, *17*, 171-181. doi:10.1027/1016-9040/a000076.

Crocetti, E., Rubini, M., & Meeus, W. H. J. (2008). Capturing the dynamics of identity formation in various ethnic groups: Development and validation of a three-

dimensional model. *Journal of Adolescence*, *31*, 207–222. doi:10.1016/j.adolescence.2007.09.002

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, *49*, 71–75. doi:10.1207/s15327752jpa4901_13

Dimitrova, R., Buzea, C., Taušová, J., Uka, F., Zakaj, S., & Crocetti, E. (2018). Relationships between identity domains and life satisfaction in minority and majority youth in Albania, Bulgaria, Czech Republic, Kosovo, and Romania. *European Journal of Developmental Psychology*, 15, 61-82. doi:10.1080/17405629.2017.1336997

Duncan, T. E., Duncan, S. C., Strycker, L. A., Li, F., & Alpert, A. (1999). *An introduction to latent variable growth curve modeling: Concepts, issues and applications*. Mahwah, NJ: Erlbaum.

Erikson, E. H. (1968). *Identity, youth and crisis*. New York, NY: Norton.

Galliher, Renee V.,McLean, Kate C.,Syed, Moin. (2017). An integrated developmental model for studying identity content in context. *Developmental Psychology*, 53, 2011-2022. doi:10.1037/dev0000299

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: a research note. *Journal of Child Psychology and Psychiatry*, *38*, 581–586. doi:10.1111/j.1469-7610.1997.tb01545.x

Goossens, L. (2001). Global versus domain-specific statuses in identity research: A comparison of two self-report measures. *Journal of Adolescence*, *24*, 681–699. doi:10.1006/jado.2001.0438

Grotevant, H. D. (1987). Toward a process model of identity formation. *Journal of Adolescent Research*, *2*, 203–222. doi:10.1177/074355488723003

Hatano, K., & Sugimura, K. (2017). Is Adolescence a period of identity formation for all

youth? Insights from a four-wave longitudinal study of identity dynamics in Japan. *Developmental Psychology*, *53*, 2113-2126. doi:10.1037/dev0000354

Hatano, K., Sugimura, K., & Crocetti, E. (2016). Looking at the dark and bright sides of identity formation: New insights from adolescents and emerging adults in Japan. *Journal of Adolescence*, *47*, 156–168. doi:10.1016/j.adolescence.2015.09.008

Hatano, K., Sugimura, K., & Schwartz, S. (2018). Longitudinal links between identity consolidation and psychosocial problems in adolescence: Using bi-factor latent change and cross-lagged effect models. *Journal of Youth and Adolescence*, *47*, 717-730. doi:10.1007/s10964-017-0785-2

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people on the world? *Behavioural and Brain Sciences*, *33*, 61–135. doi:10.1017/S0140525X0999152X

Jackson, J. J., & Allemand, M. (2014). Moving personality development research forward: Applications using structural equation models. *European Journal of Personality, 28,* 300–310. doi:10.1002/per.1964

Kadono, Y. (1994). *Jinsei ni taisuru manzokudo syakudo (the Satisfaction with Life Scale: SWLS) nihongo ban sakusei no kokoromi*. [Development of a Japanese version of the the satisfaction with life scale (SWLS)]. Poster presented at the 36th Conference of the Japanese association of Educational Psychology, September 28–30, Kyoto, Japan.

Karaś, D., & Cieciuch, J. (2018). The relationship between identity processes and well-being in various life domains. *Personality and Individual Differences*, 121, 111-119. doi:10.1016/j.paid.2017.09.027

Klimstra, T. A., Hale III, W. W., Raaijmakers, Q. A. W., Branje, S. J. T., & Meeus, W. H. J. (2010). Identity formation in adolescence: Change or stability? *Journal of Youth and Adolescence*, *39*, 150–162. doi:10.1007/s10964-009-9401-4

Klimstra, T, A., & van Doeselaar, L, V. (2017). Identity formation in adolescence and young

adulthood. In J. Specht. (Eds). *Personality development across the life span*. (pp. 293–308). London: Academic Press.

Kroger, J., & Marcia, J. E. (2011). The identity statuses: Origins, meanings, and interpretations. In S. J. Schwartz, K. Luyckx & V. L. Vignoles (Eds.), *Handbook of identity theory and research* (pp. 31–53). New York, NY: Springer.

Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*, *83*, 1198–1202. doi:10.1080/01621459.1988.10478722

Luyckx, K., Seiffge-Krenke, I., Schwartz, S. J., Crocetti, E., & Klimstra, T. A. (2014). Identity configurations across love and work in emerging adults in romantic relationships. *Journal of Applied Developmental Psychology*, *35*, 192–203. doi:10.1016/j.appdev.2014.03.007

Lyubomirsky, S., & Lepper, H. (1999). A measure of subjective happiness: Preliminary reliability and construct validation. *Social Indicators Research*, *46*, 137–155. doi:10.1023/A:1006824100041

Marcia, J. E. (1966). Development and validation of ego-identity status. *Journal of Personality and Social Psychology*, *3*, 551–558. doi:10.1037/h0023281

McArdle, J. J., & Nesselroade, J. R. (1994). Using multivariate data to structure developmental change. In H. W. Reese & S. H. Cohen (Eds*.), Lifespan developmental psychology: Methodological contributions* (pp. 223–267). Hillsdale, NJ: Lawrence Erlbaum.

Meeus, W. H. J. (2011). The study of adolescent identity formation 2000–2010: A review of longitudinal research. *Journal of Research on Adolescence*, *21*, 75–94. doi:10.1111/j.1532-7795.2010.00716.x

Meeus, W. H. J., Iedema, J., Helsen, M., & Vollebergh, W. (1999). Patterns of adolescent

identity development: Review of literature and longitudinal analysis. *Developmental Review*, *19*, 419 – 461. doi:10.1006/drev.1999.0483

Meeus, W. H. J., van de Schoot, R., Keijsers, L., & Branje, S. (2012). Identity statuses as developmental trajectories: A five-wave longitudinal study in early-to-middle and middle-to-late adolescence. *Journal of Youth and Adolescence*, *41*, 1008–1021. doi:10.1007/s10964-011-9730-y

Meeus, W. H. J., van de Schoot, R., Keijsers, L., Schwartz, S. J., & Branje, S. (2010). On the progression and stability of adolescent identity formation: A five-wave longitudinal study in early-to-middle and middle-to-late adolescence. *Child Development*, *81*, 1565–1581. doi:10.1111/j.1467-8624.2010.01492.x

Mercer, N., Crocetti, E., Branje, S., van Lier, P., & Meeus, W. H. J. (2017). Linking delinquency and personal identity formation across adolescence: Examining between- and within-person associations. *Developmental Psychology, 53*, 2182-2194. doi:10.1037/dev0000351

Ministry of Health, Labor and Welfare (2016). Chingin kōzō kihon tōkei chōsa [Basic Survey on Wage Structure in 2016]. Retrieved from https://www.mhlw.go.jp/toukei/itiran/roudou/chingin/kouzou/16/index.html

Ministry of Health, Labour, and Welfare. (2009). Zenkoku katei jidō chōsa [Nationwide Survey on Families and Children in 2009]. Retrieved from https://www.mhlw.go.jp/stf/houdou/2r9852000001yivt.html

Morsünbül, Ü., Crocetti, E., Cok, F., & Meeus, W. H. J. (2016). Identity statuses and psychosocial functioning in Turkish youth: A person-centered approach. *Journal of Adolescence, 47,* 145–155. doi:10.1016/j.adolescence.2015.09.001

Muthén, L. K., & Muthén, B. O. (1998–2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.

Nagin, D. S. (2005). *Group-based modeling of development*. Cambridge, MA: Harvard University Press.

National institution for youth education (2015). The reports for life and consciousness of high school students in Japan, United States, China, and Korea. http://www.niye.go.jp/kanri/upload/editor/98/File/06.3.pdf

Phinney, J. S., & Baldelomar, O. A. (2011). Identity development in multiple cultural contexts. In L. A. Jensen (Ed.), *Bridging cultural and developmental approaches to psychology: New syntheses in theory, research, and policy* (pp. 161–186). New York, NY: Oxford University Press.

Pop, E., Negru-Subtirica, O, Crocetti, E., & Meeus, W. (2016). On the interplay between academic achievement and educational identity: A longitudinal study. *Journal of Adolescence*, 47, 135-144. doi:10.1016/j.adolescence.2015.11.004

Shaw, D. S., Gilliom, M., Ingoldsby, E. M., & Nagin, D. (2003). Trajectories leading to school age conduct problems. *Developmental Psychology*, *39*, 189–200. doi:10.1037/0012-1649.39.2.189

Shimai, S., Otake, K., Utuki, N., Ikemi, A., & Lyubomirsky, S. (2004). Nihonban syulanteki koufukukan syakudo (Subjective Happiness Scale: SHS) no shinraisei to datousei no kentou [Development of a Japanese version of the subjective happiness scale (SHS), and examination of its validity and reliability]. *Japanese Journal of Public Health*, *51*, 845–853.

Siennick, S. E., & Staff, J. (2008). Explaining the educational deficits of delinquent youths. *Criminology: An Interdisciplinary Journal*, 46, 609–635. doi:10.1111/j.1745-9125.2008.00118.x

Sugawara, M., Sakai, A., Sugiura, T., & Matsumoto, A. (2006). SDQ: The Strengths and Difficulties Questionnaire. http://www. sdqinfo.com/. Accessed 2 Jun 2019.

Sugimura, K., Matsushima, K., Hihara, S., Takahashi, M., & Crocetti, E. (2018). A culturally sensitive approach to the relationships between identity formation and religious beliefs in youth. *Journal of Youth and Adolescence*. doi:10.1007/s10964-018-0920-8

Sugimura, K. & Mizokami, S. (2012). Personal Identity in Japan. Identity Around the World. *New Directions for Child and Adolescent Development*, 138, 123-143. doi:10.1002/cad.20025

Statistics Bureau of Japan. (2018). Gakkou kihon chousa [School Basic Survey]. Retrieved from http://www.mext.go.jp/b_menu/toukei/chousa01/kihon/sonota/1355787.htm

van Doeselaar, L, V., Becht, A. I., Klimstra, T. A., & Meeus, W. H. J. (2018). A Review and Integration of Three Key Components of Identity Development: Distinctiveness, Coherence, and Continuity. *European Psychologist*, 23, 278-288. doi:10.1027/1016-9040/a000334.

van de Vijver, F. J. R., Breugelmans, S. M., & Schalk-Soekar, S. (2008). Multiculturalism: Construct validity and stability. *International Journal of Intercultural Relations,* 32, 93-104. doi:10.1016/j.ijintrel.2007.11.001

Vosylis, R., Erentaitė, R., & Crocetti, E. (2018). Global versus domain-specific identity processes: Which domains are more relevant for emerging adults? *Emerging Adulthood, 6,* 32-41. doi:10.1177/2167696817694698

Table 1 *Fit Indices of the U-MICS Measurement Model*

	χ^2	*df*	CFI	RMSEA [90% CI]	|ΔCFI|	|ΔRMSEA|
Educational identity						
Configural	401.432	96	.984	.029 [.026-.032]		
Metric	412.286	114	.985	.026 [.023-.029]	.001	.003
Schalar	468.752	141	.983	.025 [.022-.027]	.002	.001
Interpersonal identity						
Configural	524.350	96	.971	.034 [.031-.037]		
Metric	538.710	114	.971	.031 [.028-.034]	.000	.003
Schalar	565.834	141	.971	.028 [.026-.030]	.000	.003

Note: χ^2 = chi-square, df = degree of freedom, CFI = comparative fit index, RMSEA = root mean square error of approximation and 90% confidence interval, Δ = change in parameter

Table 2 *The Mean and Variance of Intercepts, Linear Slope, and Quadratic Slope in Identity Processes*

Variables	Growth factors			Model fit			
	Intercept *M* (σ^2)	Linear slope *M* (σ^2)	Quadratic slope *M* (σ^2)	χ^2	*df*	CFI	RMSEA [90% CI]
Educational identity							
Commitment	3.08*** (.24**)	.12*** (.04)	-.02* (.00)	2.46	1.00	1.00	.039 [.000-.103]
In-depth Exploration	2.90*** (.19*)	.08* (.10)	-.01 (.02*)	1.99	1.00	1.00	.032 [.000-.098]
Reconsideration of Commitment	2.67*** (.22**)	.12*** (.05)	.00 (.00)	.04	1.00	1.00	.000 [.000-.048]
Interpersonal identity							
Commitment	3.19*** (.21***)	.11*** (.04)	-.04*** (.00)	1.34	1.00	1.00	.019 [.000-.090]
In-depth Exploration	3.11*** (.25***)	.06 (.15)	-.02 (.01)	.14	1.00	1.00	.000 [.000-.062]
Reconsideration of Commitment	2.70*** (.25**)	.02 (.13)	.01 (.01)	1.70	1.00	1.00	.027 [.000-.095]

*p<.05, **p<.01, ***p<.001

Note: χ^2 = chi-square, df = degree of freedom, CFI = comparative fit index, RMSEA = root mean square error of approximation and 90% confidence interval

M = mean, σ^2 = variance

Table 3 *Results of Different Latent Class Growth Analyses*

				Trajectory group prevalence (%)					
Solution	BIC	Entropy	BLRT *p* - value	1	2	3	4	5	6
Educational identity									
Class 2	18305.64	.81	.000	75.3	24.7				
Class 3	17729.43	.83	.000	66.9	21.7	11.4			
Class 4	17612.15	.84	.000	62.6	5.9	12.3	19.2		
Class 5	**17499.88**	**.82**	**.000**	**6.2**	**18.6**	**55.5**	**12.0**	**7.7**	
Class 6	17347.45	.82	.000	52.4	8.6	12.8	6.2	15.8	4.2
Interpersonal identity									
Class 2	17611.91	.72	.000	58.9	41.1				
Class 3	16952.36	.83	.000	11.9	64.2	24.0			
Class 4	16830.85	.83	.000	22.7	12.0	6.3	59.0		
Class 5	**16682.56**	**.85**	**.000**	**4.3**	**20.6**	**59.3**	**9.7**	**6.1**	
Class 6	16608.41	.84	.000	8.8	25.6	3.1	3.7	53.0	5.8

Note: The bolded values indicate the chosen model.
BIC = bayesian information criterion, BLRT = bootstrapped likelihood ratio test
The solutions in bold were selected.

Table 4 *Final Parameter Estimates of Latent Class Growth Analysis in Educational and Interpersonal Domains*

	Educational identity					Interpersonal identity				
	Achievement	Searching moratorium	Moratorium	Diffusion	D to M	Achievement	Searching moratorium	Moratorium	D-M-D	M-D-M
CM intercept	3.70***	3.64***	3.10***	2.23***	2.33***	3.63***	3.73***	3.11***	2.20***	3.19***
CM linear slope	.01	.24**	-.01	-.17	.77***	-.01	.21**	.08	.79***	-1.08***
CM quadratic slope	.01	-.07*	.01	.08	-.16***	.00	-.06**	-.02	-.25***	.29***
IE intercept	3.14***	3.51***	2.99***	1.96***	2.01***	3.36***	3.67***	3.08***	1.91***	3.03***
IE linear slope	-.11	.31***	-.10*	-.16	.81***	-.07	.23**	.01	.79***	-1.48***
IE quadratic slope	.06	-.10***	.04*	.07	-.17***	.00	-.07**	.00	-.23***	.42***
RC intercept	1.86***	3.07***	2.89***	1.99***	1.95***	1.84***	3.07***	2.77***	2.01***	2.69***
RC linear slope	.22	.27**	-.05	-.10	.73***	-.04	.09	.04	.39**	-1.14***
RC quadratic slope	-.05	-.08**	.01	.07	-.16***	.02	-.02	.00	-.12**	.35***

*p<.05, **p<.01, ***p<.001

Note: CM = commitment; IE = in-depth exploration; RC = reconsideration of commitment

Table 5 *Cross Tabulation between Educational Identity Trajectories and Interpersonal Identity Trajectories*

	Interpersonal identity					Total (%)
	Achievement	Searching moratorium	Moratorium	D-M-D	M-D-M	
Educational identity						
Achievement	23.33 (+) ASR = 5.76***	16.67 ASR = -0.77	43.33 (-) ASR = -2.60**	13.33 ASR = 0.98	3.33 ASR = -0.40	100
Searching moratorium	3.33 ASR = -1.72	54.44 (+) ASR = 12.45***	38.89 (-) ASR = -6.18***	2.22 (-) ASR = -3.76**	1.11 (-) ASR = -2.36*	100
Moratorium	4.66 (-) ASR = -2.09*	13.59 (-) ASR = -5.98***	72.25 (+) ASR = 9.16***	5.40 (-) ASR = -5.06***	4.10 ASR = -0.41	100
Diffusion	13.33 (+) ASR = 2.73**	4.00 (-) ASR = -3.69***	36.00 (-) ASR = -4.28***	30.67 (+) ASR = 6.38***	16.00 (+) ASR = 5.16***	100
D to M	3.45 ASR = -1.27	12.93 (-) ASR = -2.17*	54.31 ASR = -1.17	25.86 (+) ASR = 6.26***	3.45 ASR = -0.50	100
Total	6.10	20.56	59.30	9.71	4.34	100

Note. ASR = adjusted standardized residual; observed values indicated in bold are significantly different from expected values (tested by using adjusted
residual analysis): (+) indicates that the observed value is higher than the expected value; (-) indicates that the observed value is lower than the expected
value.
*$p < .05$ (ASR ≥ |1.96|), **$p < .01$ (ASR ≥ |2.58|), ***$p < .001$ (ASR ≥ |3.29|).

Table 6 *Correlations among Class Probability, Subjective Well-being and Psychosocial Problems*

Class probability	Subjective well-being				Psychosocial problems			
	Satisfaction with life		Subjective happiness		Internalizing problems		Externalizing problems	
	Levels	Changes	Levels	Changes	Levels	Changes	Levels	Changes
Educational identity								
Achievement	.13***	.04	.21***	-.05	-.29***	-.04	-.34***	-.04
Searching moratorium	.21***	.04	.20***	.03	-.10**	-.02	-.14***	-.01
Moratorium	.04	-.21***	-.06	-.13**	.21***	.04	.22***	.09
Diffusion	-.25***	.10	-.16***	.08	.01	-.06	.06	-.14*
D to M	-.20***	.15**	-.17***	.13**	.02	-.03	.06	-.06
Interpersonal identity								
Achievement	.06	.02	.11**	.00	-.27***	-.08	-.24***	-.13*
Searching Moratorium	17***	.06	.16***	.04	-.09*	-.01	-.06	.05
Moratorium	-.04	-.04	-.10**	-.02	.12**	.09	.19***	.06
D–M–D	-.21***	-.02	-.18***	.03	.07	-.08	-.04	-.11*
M–D–M	.01	-.04	.05	-.09*	.09*	-.04	.01	-.01

*p<.05, **p<.01, ***p<.001

Figure 1 Z-score trends for the three educational identity processes in the five identity trajectories. CM = commitment; IE = in-depth exploration; RC = reconsideration of commitment

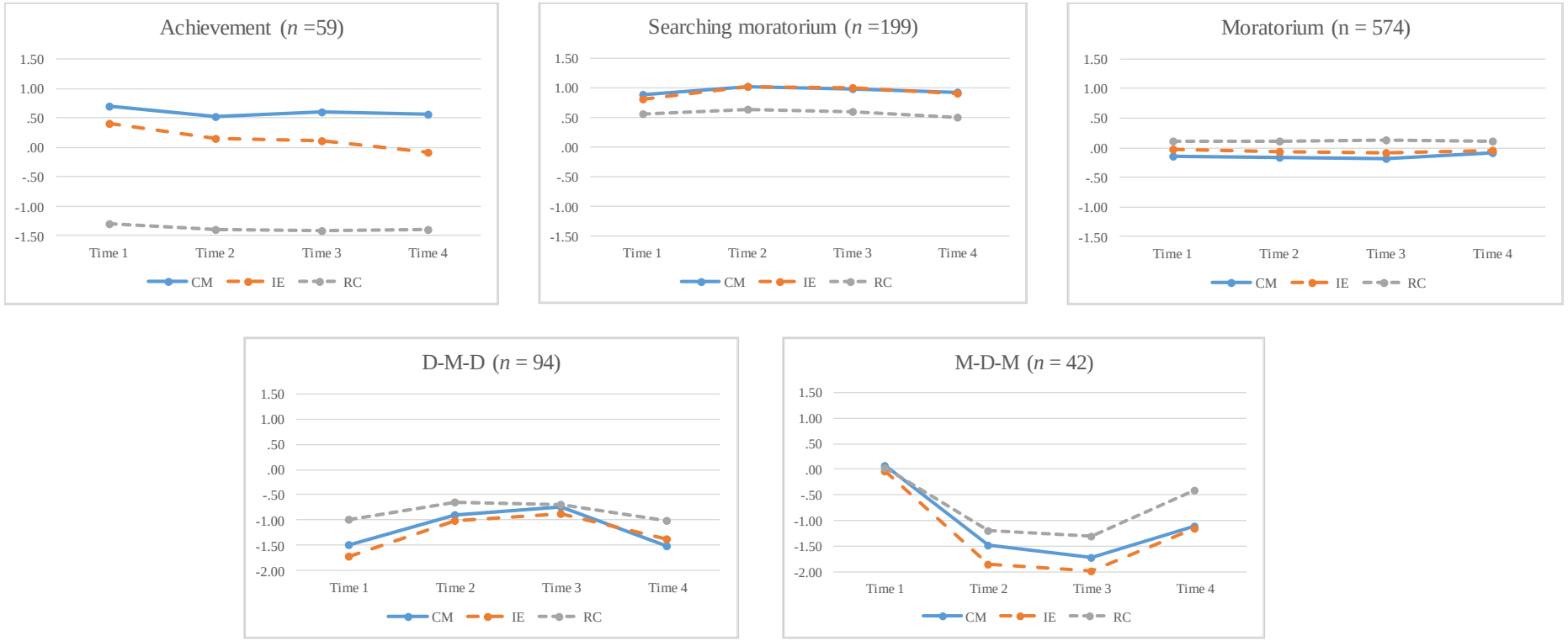

Figure 2 Z-score trends for the three interpersonal identity processes in the five identity trajectories. CM = commitment; IE = in-depth exploration; RC = reconsideration of commitment