EMPIRICAL RESEARCH

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Do Identity Processes and Psychosocial Problems Intertwine with Each Other? Testing the Directionality of Between- and Within-Person Associations

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Abstract

As forming and evaluating commitments are stressful processes, adolescents who worry about their identity may exhibit psychosocial problems. However, there is a lack of prospective research regarding the direction of associations between the processes of identity and psychosocial problems in the future domain. This study examined the direction of relationships between future-oriented identity processes and psychosocial problems based on a five-dimensional identity process model. A total of 347 Japanese 14-year-old adolescents (53.3% female) participated in a three-wave longitudinal study with a one-year-interval assessment. Standard cross-lagged models indicated that pro-active identity exploration was negatively predicted by conduct problems, and ruminative exploration was positively predicted by depressive symptoms. Within-person cross-lagged models indicated that ruminative exploration positively predicted both depressive symptoms and conduct problems at the within-person level. These findings reveal how identity processes and psychosocial problems are interwoven during adolescence.

Introduction

Adolescence is a period critical to identity formation. Erikson (1968) described the development of identity as the change from a fragmented sense of self to a clear sense of identity. During this process of identity development, adolescents explore options related to their identity, and then commit to certain life choices related to their identity (Marcia 1966). Even after making decisions about commitments, adolescents continue to think about their choices and, partially as a result, they may experience a sense of self-confidence derived from these choices (Luyckx et al. 2006). These identity formation and evaluation cycles emerge in various domains including the domains of

ideological, interpersonal (Meeus et al. 2010), and future (Luyckx et al. 2008). Specifically, the future is a critically important identity domain for adolescents (Luyckx et al. 2008), because adolescents are required to start thinking about their future and how they could navigate future life challenges (Nurmi 1991).

As forming and evaluating commitments are stressful processes, adolescents who worry about their identity may exhibit psychosocial problems (Erikson 1968). Psychosocial problems can be divided into two components: One is individual's internal responses to psychological environment like anxiety and depressive mood, and another is individual's external responses to psychological environment like aggression and delinquent behaviors (e.g., Achenbach et al. 2002). Specifically, early and middle adolescents, that is, individuals from 12- to 15-year-olds and from 16- to18-year-olds, respectively (e.g., Meeus 2018), are at an increased risk of depressive symptoms and delinquent behaviors (for a review, see Meeus 2016). Research has provided evidence for the relationship between identity processes and depressive symptoms (Becht et al. 2019) and delinquent behaviors (Mercer et al. 2017). However, there is a lack of prospective research regarding the direction of associations between the processes of identity and psychosocial problems in the future domain.

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This study addresses these issues by examining the direction of associations between the commitment formation process and depressive symptoms and conduct problems, using both between- and within-person approaches. By doing so, this study shed light on the developmental dynamics of future-oriented identity formation processes and psychosocial problems from early to middle adolescence in Japan.

Identity Processes in the Future Domain: Five-Dimensional Identity Process Model

Based on Marcia's (1966) identity status paradigm, various contemporary identity process models were developed (for a review, see van Doeselaar et al. 2018). Luyckx and colleagues described a process of future-oriented identity formation that comprises five identity dimensions (Luyckx et al. 2008). *Exploration in breadth* indicates the active search for and consideration of different identity. *Commitment-making* refers to committing to one or more of the options considered. *Exploration in depth* represents the careful evaluation of one's existing commitments. *Identification with commitment* refers to self-confidence derived from their choices. *Ruminative exploration* represents continuing to worry about their life choices.

These five identity dimensions are grouped into two complementary cycles (Luyckx et al. 2008). The first cycle is the *commitment formation cycle* that includes exploration in breadth and commitment making. This cycle represents the processes through which individuals try to actively search for different identity alternatives and to make firm choices. The second cycle is the *commitment evaluation cycle* including exploration in depth and identification with commitment. In this second cycle, individuals who are committed to their identity continue to actively manage their commitments by thinking about their choices, seeking additional information, and talking with others about their commitments. Such activities are ways for them to gain self-confidence. Ruminative exploration may occur at any stage in these identity cycles and delay the process of identity development for its repetitive and passive mode of exploration. The commitment formation cycle is significant in early and middle adolescence, and the commitment evaluation cycle is prominent in late adolescence and young adulthood (Luyckx et al. 2013).

As individuals who have a strong sense of commitment and engage in proactive explorations are viewed as active agents in their own development, they feel confident about their choices and hope for their future (Lerner et al. 2005). On the contrary, adolescents who are unable to develop a clear vision about their future self tend to feel hopefulness, anxiety, and depression (Luyckx et al. 2008), and they may turn to delinquent behaviors (van Gelder et al. 2013). In fact, previous cross-sectional studies have shown that commitment making, identification with commitment, and exploration in breadth were negatively related to depressive symptoms (Luyckx et al. 2013), anxiety (Luyckx et al. 2015), and delinquent behaviors, like as rule breaking and social and physical aggression (Schwartz et al. 2011), whereas, in the same studies, ruminative exploration was positively related to them. These findings suggest that commitment processes and proactive exploration are linked to less psychosocial problems, whereas ruminative exploration may be linked to the development of psychosocial problems.

Between- and Within-Person Associations Among Identity Processes and Psychosocial Problems

Recently, identity researchers have focused on both between- and within-person approaches to examine identity development as these two approaches can capture distinctive developmental processes (Becht et al. 2019; Bogaerts et al. 2019; Mercer et al. 2017). Between-person models provide information about the rank-order stability within a *group* over time (Papp 2004). More specifically, a between-person model could provide information about whether adolescents who score higher on identity processes relative to others also score higher on psychosocial problems relative to others over time. On the other hand, within-person models provide evidence of dynamic relations between two variables within *one person* (Papp 2004). Thus, a within-person model could potentially provide information about whether an increase in an adolescent's own score on identity processes may lead an increase in the adolescent's psychosocial problems. Furthermore, by combining between- and within-person models, it is possible to identify individuals at risk for identity-related difficulties at the between-person level and it may also be possible to identify mechanisms towards which one can focus intervention efforts at the within-person level (Bogaerts et al. 2018; see also Luyckx et al. 2012).

Previous research on identity has revealed the distinctive direction of associations between identity processes and psychosocial problems using such a combined approach. Indeed, at the between-person level, depressive symptoms (Schwartz et al. 2012) and delinquent behaviors (Mercer et al. 2017) have been found to predict identity processes, and at the within-person level, ruminative exploration has been shown to predict depressive symptoms (Becht et al. 2019) and delinquent behaviors predict exploration in depth (Mercer et al. 2017). Furthermore, delinquent behaviors predict commitment and reconsideration of commitment (Mercer et al. 2017). These results suggest that identity processes seem to be predicted by psychosocial problems at the between-person level, but identity processes seem to predict psychosocial problems and predicted by psychosocial problems at the within-person level. The differences in the direction of

associations between two levels may be caused by the fact that between-person models grasp the process of identity-related risk at the group level, and within-person models unpack the mechanisms of the risk at the individual level (e.g., Bogaerts et al. 2018). Thus, the results of between-person models may reflect that adolescents who show psychosocial problems more than their peers may be increasingly discouraged their capacity to form strong identity commitments over time, possibly because they have poor relationships with others including friends, parents, and teachers due to their expression of problems, and hence, receive less support from others for identity formation. In contrast, the results of within-person models imply bidirectionality as a possible mechanism for cooccurrence of the difficulty in identity formation and psychosocial problems (Erikson 1968; see also Klimstra and Denissen 2017); behind the cooccurrence, there is a pathway in which an increase (or a decrease) of psychosocial problems leads an increase (or a decrease) of difficulty in identity processes, and the opposite pathway exists as well.

While previous prospective research has focused mainly on identity processes in the *commitment evaluation cycle* (e.g., Becht et al. 2019), the linking between identity processes of the *commitment formation cycle* and psychosocial problems are unclear. Early and middle adolescence are the periods of life in which individuals start to explore and commit to their identity options in the future domain (Luyckx et al. 2008). Specifically, exploration in breadth is the first step toward finding commitment in the future domain (Luyckx et al. 2013); hence, discovering the associations between psychosocial problems and exploration in breadth may contribute to obtaining insight into how to support healthy identity development during adolescence. Furthermore, using the five-dimensional model, there have been no studies to examine the direction of associations between future-oriented identity processes and delinquent behaviors at both between-person and within-person levels. Early and middle adolescence are the periods in which individuals may develop both depressive symptoms and delinquent behaviors (Luyckx et al. 2013). Hence, commitment formation processes and depressive symptoms and delinquent behaviors may be closely linked to each other. Therefore, this study focuses on the processes in the commitment formation cycle and clarifies the direction of the associations between these identity processes and depressive symptoms and delinquent behaviors both at the between-person and within-person levels.

Identity Formation during Early to Middle Adolescence in Japan

Given that social and cultural factors inevitably affect the ways in which adolescents explore and choose their identity options (Phinney and Baldelomar 2011), it is crucially important to consider the context where research is conducted. Japan has several significant features in terms of the challenges faced by adolescents. First, preparing for the entrance examination for high school is the first opportunity for 15–year–old early adolescents to explore and decide the *future* matter, that is considering which high school to choose. Early adolescents in Japan are strongly required to concentrate on study to prepare for the entrance examination for high school. In Japan, education is compulsory from elementary through junior high school, and 98.7% of junior high school students attend high school (Statistics Bureau of Japan 2018); thus, the majority of youth aged 15 years take an examination to gain acceptance to the high school they wish to attend.

Second, early and middle adolescence for Japanese youth are the periods of increased risk of depressive symptom and delinquent behaviors (Ministry of Education, Culture, Sports, Science and Technology 2017). The increase in depressive symptoms and delinquent behaviors is a common factor for instability in mental health that coincides with the physical, cognitive, and social changes of adolescence. However, such an increase is also related to highly stressful situations about future decisions in Japan. Japanese adolescents believe that receiving a higher education guarantees one's success in life (Sugimura and Mizokami 2012). The success means landing a permanent job in a company with a seniority wage system, which is believed as an ideal career in Japan (National Institution for Youth Education 2015). Around this period of decision, most early and middle adolescents experience anxiety about their own future. Indeed, a national survey conducted in Japan indicated that about 80% of junior and high school students reported anxiety concerning their study and career decisions (Cabinet Office 2018). Thus, in Japan, anxieties about study and entrance examination may lead depressive symptoms and delinquent behaviors in adolescents.

Third, Japanese people tend to develop close interpersonal relationships with friends and colleagues within the institution to which they belong and to construct strong emotional ties with them (Brinton 2011). Given this, Japanese adolescents must be adaptive at making close friendships with schoolmates or classmates; hence, keeping a good relationship with friends is one of the most important issues to them (Cabinet Office 2018). Therefore, conduct problems, one type of delinquent behaviors which represents repetitive patterns of violent behaviors such as antisocial behaviors (Goodman 1997) are likely an immediate problem of concern that disrupts interpersonal relations during early adolescence in Japan (Ministry of Education, Culture, Sports, Science and Technology 2017).

Current Study

This study examined the direction of associations between commitment formation processes and depressive symptoms and conduct problems during early to middle adolescence in Japan. To accomplish this purpose, two steps were taken. First, the standard cross-lagged panel model was used to examine the direction of associations between identity process and psychosocial problems at the between-person level. This model is commonly used to capture the direction of between-person associations among variables (e.g., Bogaerts et al. 2018). Previous cross-sectional studies have shown that commitment making and exploration in breadth were negatively related to depressive symptoms and delinquent behaviors, whereas ruminative exploration was positively related to them (e.g., Schwartz et al. 2011). Furthermore, longitudinal research based on another identity model has indicated that commitment and reconsideration of commitment (Crocetti et al. 2008) were predicted by depressive symptoms and delinquent behaviors at the between-person level (e.g., Mercer et al. 2017). In line with these findings, identity processes would be predicted by depressive symptoms and conduct problems at the between-person level.

Second, this study tested the direction of associations between identity processes and depressive symptoms and conduct problems using the random intercept cross lagged panel model (Hamaker et al. 2015). This model is commonly used to capture the direction of within-person associations among variables (e.g., Becht et al. 2019). According to Becht et al. (2019), ruminative exploration predicted depressive symptoms at the within-person level. Furthermore, longitudinal research based on another identity model showed that exploration in depth predicted delinquent behaviors, and at the same time, delinquent behaviors predicted commitment and reconsideration of commitment at the within-person level (Mercer et al. 2017). In line with these findings, an increase in ruminative exploration would predict an increase in depressive symptoms; on the other hand, an increase in conduct problems would predict an increase in ruminative exploration. Regarding commitment making and exploration in breadth in the future domain, there is no research examining the association with psychosocial problems at the within-person level. Theoretically, a clear sense of commitment and proactive exploration would lead a decrease in psychosocial problems (e.g., Luyckx et al. 2008). Cross-sectional studies have indicated that commitment and proactive exploration components were negatively related to depressive symptoms (Luyckx et al. 2013) and delinquent behaviors (Schwartz et al. 2011). In line with these theoretical and experimental assumptions, an increase in commitment-making and exploration in breadth would predict a decrease in depressive symptoms and conduct problems at the within-person level.

Methods

Participants

Data were obtained from the Japanese Longitudinal Identity Research Project (for the details, see Hatano et al. 2019), which consisted of four waves conducted from March 2013 to March 2016 with one-year assessment intervals. To use the variables matching the purpose in this study, the data from three waves conducted from March 2014 to March 2016 was used. In the first wave (T1), participants were 438 Japanese adolescents aged 14 years; these participants were followed until they were aged 16 years. Most participants experienced the transition from junior to high school between the second (T2) and third (T3) waves; specifically, at T3, 94% of the 16-year-old participants attended high school, and 6% held either permanent or non-permanent employment.

At T2 and T3, 357 and 212 participants, respectively, provided data. In this study, the data of participants who provided information at least at two time points were analyzed to ensure the reliable and valid individual estimates of linear slopes (e.g., Shaw et al. 2003). This process resulted in a final sample of 347 adolescents (53.3% female); this number was 72.7% of the original sample. Overall, 27.3% of the data were missing. There were no significant differences between individuals who did or did not complete in terms of identity processes and psychosocial problems at T1 (Wilks's $\lambda = 0.99$; $F(5, 432) = 0.82$; $p = 0.538$, $\eta^2 = 0.01$), T2 (Wilks's $\lambda = 0.99$; $F(5, 351) = 0.56$; $p = 0.729$, $\eta^2 = 0.01$), and T3 (Wilks's $\lambda = 0.98$; $F(5, 206) = 0.70$; $p = 0.625$, $\eta^2 = 0.02$). Little's (1988) Missing Completely at Random test was used to examine missing data. A non-significant χ^2 value for this test was obtained, $\chi^2(30) = 33.08$, $p = 0.31$, suggesting that missing values could be reliably estimated. The full information maximum likelihood procedure was employed in Mplus 7.2 (Muthén and Muthén 1998).

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 the present participants were registered with the company. For the present research, the requests to the company were defined as follows: (1) participants should be of Japanese

nationality, (2) participants to be recruited throughout Japan, and (3) the number recruited should contribute to the goal of this study, that is, approximately 600 participants. Early and middle adolescents 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 0.50 USD) for completing the questionnaire. About 70% of the participants lived in the Kanto, Chubu, and Kinki metropolitan districts, that is, urban areas in eastern, central, and mid-western Japan, respectively. The remaining participants lived in the Hokkaido, Tohoku, Chugoku, Shikoku, and Kyushu districts that are relatively rural areas compared to the Kanto, Chubu, and Kinki metropolitan districts.

Measures

Identity processes

Identity processes were assessed using the Dimensions of Identity Development Scale (DIDS; Luyckx et al. 2008; for the Japanese version, see Nakama et al. 2014). This measure consists of 25 items assessing five identity dimension subscales (each subscale comprised five items); responses are on a 5-point Likert scale (1 = *completely untrue*, 5 = *completely true*). In line with the aim of this study, three subscales related to the commitment formation cycle were used: commitment making (sample item: "I have decided on the direction I want to follow in my life"), exploration in breadth (sample item: "I have made a choice on what I am going to do with my life"), and ruminative exploration (sample item: "I keep looking for the direction I want to take in my life"). Across the three waves, Cronbach's alpha values ranged from 0.94 to 0.95 for commitment making; from 0.92 to 0.93 for exploration in breadth; and from 0.86 to 0.92 for ruminative exploration.

Depressive symptoms and conduct problems

Depressive symptoms and conduct problems were assessed using two subscales of the Strengths and Difficulties Questionnaire (Goodman 1997; for the Japanese version, see Sugawara et al. 2006). Participants rated 25 items on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). In line with the aim of this study, two subscales were used: depressive symptoms were assessed by a 5-item emotional symptoms subscale (sample item: "I am often

unhappy, depressed or tearful") and conduct problems were assessed by a 5-item conduct problems subscale (sample item: "I am constantly fidgeting or squirming"). Across the three waves, Cronbach's alpha values ranged from 0.75 to 0.79 for depressive symptoms, and from 0.68 to 0.73 for conduct problems.

Statistical Analysis

To test hypotheses, the present analyses proceeded in two steps. First, a cross-lagged panel model was conducted to examine the direction of associations between identity processes and psychosocial problems at the between-person level. In the cross-lagged panel model, stability paths, cross-lagged paths, T1 (Time 1) correlations, and correlated changes were estimated. Regarding the cross-lagged paths, the paths between identity processes and psychosocial problems were estimated. Second, a random intercept cross-lagged panel model was conducted to examine the direction of associations between identity processes and psychosocial problems at the within-person level. This modeling approach differs from cross-lagged panel modeling by including a random intercept for the levels of all identity processes and psychosocial problems to capture stable individual differences between adolescents. That is, for each construct of identity and psychosocial problems, the individual has an expected score, which is based on the sample mean across three years. This score represents the individual stable trait factor as the random intercept. Furthermore, the variance at the within-person level captures adolescents' year-to-year fluctuations relative to their own expected score. Thus, by separating stable individual differences in identity processes and psychosocial problems between adolescents from within-person processes, it is possible to investigate how within-person changes in identity processes and psychosocial problems are associated over time. The interpretation of parameters in a random intercept cross-lagged panel model is different from those in a cross-lagged panel model. Most importantly, the cross-lagged parameter reflects whether an adolescent's deviation from his or her expected score can be predicted by the adolescent's deviation from his or her own score on the previous wave in the random intercept cross-lagged panel model (Hamaker et al. 2015; see also Becht et al. 2019).

To investigate the direction of associations between identity processes and psychosocial problems, two types of models were tested; a fully unconstrained model as baseline model, and a model in which all cross-lagged paths, initial correlations, and correlated changes are set to be equal. For optimal model fit, the Comparative Fit Index (CFI) should exceed 0.95, with values higher than 0.90 considered to be acceptable, and the Root Mean Square Error of Approximation (RMSEA) should be less than 0.05, with values less

Table 1 Descriptive statistics

Variable	14 years old				15 years old				16 years old			
	M	SD	Min	Max	M	SD	Min	Max	M	SD	Min	Max
Commitment making	2.86	0.93	1.00	5.00	3.09	0.87	1.00	5.00	2.95	0.83	1.00	5.00
Exploration in breadth	3.11	0.77	1.00	5.00	3.30	0.74	1.00	5.00	3.16	0.69	1.00	5.00
Ruminative exploration	3.12	0.69	1.00	5.00	3.11	0.70	1.00	5.00	3.11	0.75	1.00	5.00
Depressive symptoms	2.64	0.66	1.00	4.60	2.64	0.62	1.00	4.40	2.66	0.65	1.00	4.40
Conduct problems	2.43	0.60	1.00	3.60	2.40	0.64	1.00	4.00	2.50	0.58	1.00	3.80

M mean, *SD* standard deviation, *Min* minimum, *Max* maximum

than 0.08 representing reasonable fit (Kline 2010). To test whether the fit of the model was equivalent across time, differences in CFI and RMSEA between models were used. If the differences in model fit indices exceeded the following criteria, the null hypothesis of invariance would be rejected: ΔCFI ≥ -0.010 and ΔRMSEA ≥ 0.015 (Kline 2010). In both models, to enhance model parsimony, the models with cross paths from psychosocial problems to identity processes, identity processes to psychosocial problems, and T2-T3 within-time correlations were constrained to be equal for testing time invariance. Finally, a model with all cross paths and T2-T3 within-time correlations constrained to be equal for testing time invariance. These models were compared with the unconstrained baseline model.

Results

Descriptive Statistics

Means and standard deviations are presented in Table 1. To investigate gender and regional (urban vs. rural) differences, MANOVAs were conducted with (1) gender and (2) region as fixed factors and all variables from identity processes and psychosocial problems at T1 to identity processes and psychosocial problems in T3 as dependent variables all at once. There were no significant main effects of gender (Wilks's $\lambda = 0.92$; $F(15, 167) = 1.02$; $p = 0.433$, $\eta^2 = 0.08$) and region (Wilks's $\lambda = 0.88$; $F(15, 167) = 1.47$; $p = 0.123$, $\eta^2 = 0.12$). Correlations between identity processes and depressive symptoms and conduct problems are shown in Table 2. Commitment making was negatively related to depressive symptoms in T3. Exploration in breadth was negatively related to depressive symptoms and conduct problems in T1–T3. Ruminative exploration was positively related to depressive symptoms in T2–T3.

Identity and Psychosocial Problems: Between- and Within-Person Associations

To examine the direction of associations between identity processes and depressive symptoms and conduct problems,

cross-lagged panel model and random intercepts cross-lagged panel model were conducted. Table 3 presents the fit and model comparison results for constrained and unconstrained models. In all cases, the models fit the data well. Therefore, M2 was used as the most parsimonious model.

Direction of Associations in Between-Person Level

The stability paths, initial correlations, correlated change, and cross paths in cross-lagged panel model are presented in Fig. 1 and Table 4. As shown in Table 4, high levels of commitment were correlated with high levels of exploration in breadth. Moreover, a high level of exploration in breadth correlated with a high level of ruminative exploration. As presented in Fig. 1, a positive cross-lagged path was found from depressive symptoms to ruminative exploration one year later ($\beta = 0.16$ and 0.16; $p < 0.01$). Moreover, conduct problems negatively predicted exploration in breadth over time ($\beta = -0.11$ and -0.13; $p < 0.01$). These results suggest that identity processes were predicted by psychosocial problems at the between-person level.

Direction of Associations in Within-Person Level

In random intercepts cross-lagged panel model, random intercepts for each construct of identity and psychosocial problems, which means a factor with all loadings constrained to 1, were included to partial out stable between-person variance, so that the cross-lagged paths only refer to within-person dynamics. Regarding the between-person variance portion of this model, Fig. 2 shows that the time-invariant individual differences as the random intercepts for commitment making and exploration in breadth, and depressive symptoms and conduct problems were positively correlated (0.68 and 0.69; $p < 0.001$). There were no significantly relationships between identity processes and psychosocial problems. The cross-lagged paths presented in Fig. 2 show that when adolescents had a higher level of ruminative exploration in the prior year than they usually have, they reported increased depressive symptoms ($\beta = 0.26$ and 0.24; $p < 0.05$) and conduct problems ($\beta = 0.22$ and 0.28; $p < 0.05$) one year later. Regarding the correlated

Table 2 Correlations between identity processes and depressive symptoms and conduct problems

	T1 CM	T1 EB	T1 RE	T1 DEP	T1 CON	T2 CM	T2 EB	T2 RE	T2 DEP	T2 CON	T3 CM	T3 EB	T3 RE	T3 DEP	T3 CON
T1 Commitment making	—	0.65***	−0.06	−0.02	−0.03	0.47***	0.31***	−0.17**	−0.05	0.00	0.44***	0.20**	−0.20**	−0.04	0.05
T1 Exploration in breadth		—	0.28***	−0.18**	−0.16**	0.37***	0.46***	0.04	−0.09	−0.07	0.23**	0.35***	0.05	−0.04	−0.02
T1 Ruminative exploration			—	0.04	0.02	−0.01	0.14*	0.36***	0.04	0.03	−0.12	0.11	0.35***	0.09	−0.11
T1 Depressive symptoms				—	0.56**	−0.04	−0.13*	0.14*	0.50***	0.33***	−0.14*	−0.17*	0.09	0.52***	0.39***
T1 Conduct problems					—	−0.02	−0.16**	0.08	0.40***	0.68***	−0.07	−0.22***	0.05	0.41***	0.61***
T2 Commitment making						—	0.67***	−0.19**	−0.07	−0.03	0.47***	0.21***	−0.17*	−0.07	−0.03
T2 Exploration in breadth							—	0.10	−0.13*	−0.17**	0.22**	0.34***	0.15*	−0.08	−0.18*
T2 Ruminative exploration								—	0.12*	0.03	−0.12	0.24**	0.47***	0.22***	0.01
T2 Depressive symptoms									—	0.56***	−0.14	−0.14*	0.18*	0.57***	0.40***
T2 Conduct problems										—	−0.07	−0.22**	0.01	0.8***	0.67***
T3 Commitment making											—	0.58***	−0.13	−0.15*	−0.14*
T3 Exploration in breadth												—	0.36***	−0.07	−0.20**
T3 Ruminative exploration													—	0.26***	0.01
T3 Depressive symptoms														—	0.58***
T3 Conduct problems															—

CM commitment making, *EB* exploration in breadth, *RE* ruminative exploration, *DEP* depressive symptoms, *CON* conduct problems

$*p < 0.05$; $**p < 0.01$; $***p < 0.001$

changes (see Table 4), at ages 14 and 15, commitment making was positively correlated to exploration in breadth and negatively correlated to conduct problems over time. Ruminative exploration was positively correlated to depressive symptoms over time. Depressive symptoms were positively correlated to conduct problems over time.

Discussion

Exploring one's identity and making a firm commitment with respect to the future are central tasks in early and middle adolescence (Luyckx et al. 2008). During this process of commitment formation, some adolescents may get stuck in a process of rumination which may be associated with psychosocial problems. Previous research has indeed shown that identity processes are related to depression (Becht et al. 2019) and delinquent behaviors (Mercer et al. 2017). However, there is a lack of identity research focused on future-oriented identity processes in the commitment formation cycle and on the direction of associations between identity processes and psychosocial problems using both between- and within-person approaches. This study demonstrated the direction of associations among commitment formation processes and depressive symptoms and conduct problems by using cross-lagged panel model and random intercepts cross-lagged panel model. In cross-lagged panel model, exploration in breadth was predicted by conduct problems, and ruminative exploration was predicted by depressive symptoms. In random intercepts cross-lagged panel model, on the other hand, both depressive symptoms and conduct problems were predicted by ruminative exploration. These findings suggest that identity dynamics between commitment formation processes and psychosocial problems may differ depending on the level at which they are assessed.

Between-Person Differences

As expected, commitment formation processes were predicted by psychosocial problems at the between-person level. Specifically, the cross paths were significant for the exploration processes; that is, exploration in breadth was negatively predicted by conduct problems and ruminative exploration was positively predicted by depressive symptoms. In other words, adolescents displaying high scores on conduct problems compared to other adolescents in the sample tend to score low on exploration in breadth one year later when compared to other adolescents in the sample. Likewise, adolescents with high scores on depressive symptoms tend to score high on ruminative exploration compared to other adolescents in the sample. These results were consistent with the findings of previous identity

Table 3 Model fit of Cross-lagged Panel Model and Random Intercept Cross-lagged Panel Model

Models	Cross-Lagged Panel Model				Random Intercept Cross-Lagged Panel Model			
	χ^2	df	CFI	RMSEA [90% CI]	χ^2	df	CFI	RMSEA [90% CI]
M1: Baseline model	69.940***	25	0.957	0.072 [0.052–0.092]	25.702*	10	0.988	0.067 [0.036–0.100]
M2: Model with cross-lagged paths and correlated change fixed to be time-invariant	97.847**	55	0.959	0.047 [0.032–0.062]	49.42	44	0.996	0.019 [0.000–0.042]

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

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Fig. 1 Cross-Lagged Panel Model. Stability paths linking psychosocial problems to identity processes are shown in gray. Significant paths linking identity processes and psychosocial problems over time are shown in black. Cross-paths among identity processes are not displayed for the sake of clarity. CM commitment making, EB exploration in breadth, RE ruminative exploration, DEP depressive symptoms, CON conduct problems. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$
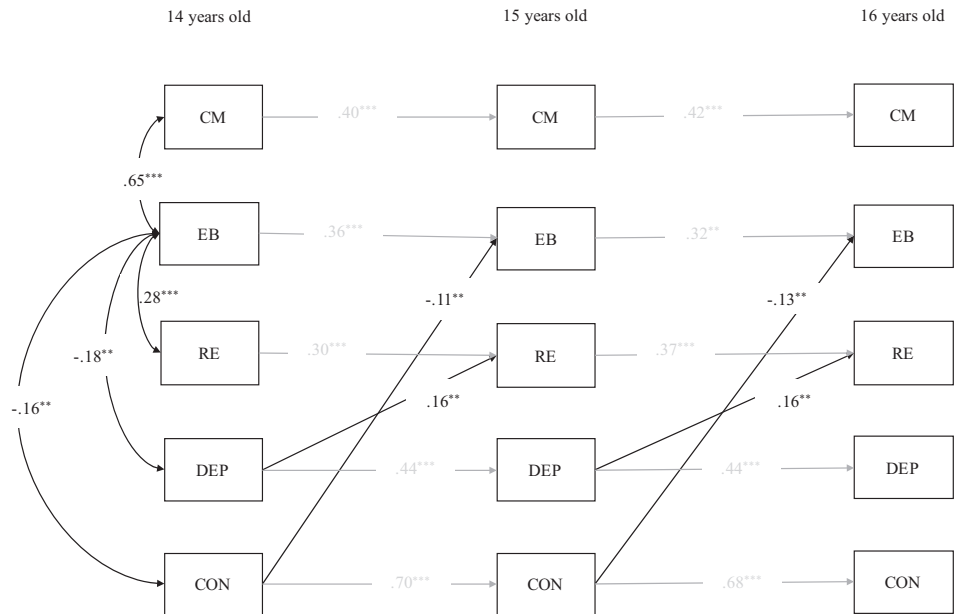
Table 4 Correlated Changes in Cross-Lagged Panel Model and Random Intercept Cross-Lagged Panel Model

| Variables	Cross-Lagged Panel Model					Random Intercept Cross-Lagged Panel Model				
	1	2	3	4	5	1	2	3	4	5
1. Commitment making	–	0.64***	−0.07	−0.05	−0.08	–	0.66***	0.03	−0.13	−0.21*
2. Exploration in breadth	0.65***	–	0.21**	−0.04	−0.09	0.66***	–	0.25*	−0.02	−0.13
3. Ruminative exploration	−0.07	0.23**	–	0.07	−0.03	0.03	0.27*	–	0.23**	0.12
4. Depressive symptoms	−0.05	−0.04	0.07	–	0.49***	−0.11	−0.02	0.1**	–	0.41***
5. Conduct problems	−0.08	−0.09	−0.03	0.51***	–	−0.23*	−0.13	0.12	0.43***	–

T2 correlated changes are displayed above the diagonal. T3 correlated changes are shown below the diagonal

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

research based on another identity model at the between-person level (Mercer et al. 2017; Schwartz et al. 2012), suggesting that adolescents who have behavior problems, compared to other adolescents in a group, tend to explore their future possibilities less, and adolescents who feel anxious and depressed seem to struggle with ongoing ruminative exploration when compared to other adolescents in a group. Furthermore, this finding supports that experiencing psychosocial problems decrease adolescents'

capacity to form strong identity commitments (Klimstra and Denissen 2017).

Specifically, in Japan, people tend to construct strong emotional ties with friends in the institutions to which they belong (Brinton 2011), such as a class and a school for adolescents. In this context, those adolescents who have depressive symptoms and conduct problems may stick out from groups of classmates or schoolmates compared to other adolescents, and they tend to receive negative

Fig. 2 Random Intercept Cross-Lagged Panel Model. Stability paths linking psychosocial problems to identity processes are shown in grey. Significant paths linking identity processes and psychosocial problems over time are shown in black. CM commitment making, EB exploration in breadth, RE ruminative exploration, DEP depressive symptoms, CON conduct problems. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$
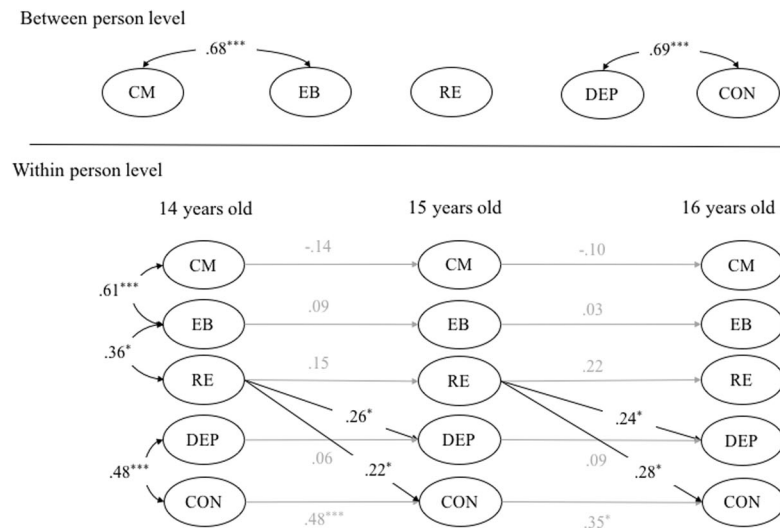
feedback from various people, such as friends, parents, and teachers. As a result, they have to pay considerable attention to be adapted to their class or school, and this decreases their capacity to make identity commitments about their future; hence they fall into rumination or explore their future in less adaptive manner. These processes may be represented in a negative relationship between the high scores of conduct problems and exploration in breadth and a positive relationship between depressive symptoms and ruminative exploration one year later.

Contrary to expectations, adolescents who scored higher on commitment making were not more likely to report lower scores on depressive symptoms and conduct problems. This may represent the characteristics of commitment; Marcia (1994) suggested that commitment adaptively works on the assumption of having a clear sense of identity. In fact, Waterman et al. (2013) found that identity commitments are protective against internalizing symptoms only when they are aligned with one's core sense of self. A more recent study reported that commitment components related to psychosocial problems only when accompanied by a clear sense of self (Bogaerts et al. 2019). Given this argument and the findings of this study, further longitudinal research is needed to reveal the interaction effects of commitment making and a clear sense of self, such as identity synthesis (Rosenthal et al. 1981) with psychosocial problems.

Within-Person Changes

Unexpectedly, ruminative exploration predicted not only depressive symptoms but also conduct problems at the within-person level. Specifically, adolescents with higher scores on ruminative exploration reported an increase (as compared to their own average level) in the scores of both depressive symptoms and conduct problems one year later.

In other words, an increase in a sense of unhealthy identity exploration may be linked with feelings of a depressive mood, and problems with conduct. Ruminative exploration is an important indicator of when identity formation goes awry in adolescence (Crocetti et al. 2016), and it was shown to predict depressive symptoms at the within-person level (Becht et al. 2019). The results of this study that ruminative exploration predicted both depressive symptoms and conduct problems highlight the characteristics of ruminative exploration as the maladaptive or dark side of identity formation.

As for the direction of associations, this study demonstrated that ruminative exploration predicted depressive symptoms and conduct problems, but not vice versa. This finding supports the idea that maladaptive identity development may dispose adolescents to develop depressive symptoms over time (Durbin and Hicks 2014). It also implies that adolescents who do not have a clear vision about their future self are likely to make delinquent choices (van Gelder et al. 2013). These results suggest that ruminative exploration is a risk factor leading the acceleration of both depressive symptoms and conduct problems on the individual level. In Japan, early and middle adolescence are characterized by the increased depressive symptoms and delinquent behaviors (Ministry of Education, Culture, Sports, Science and Technology 2017). Also, Japanese early and middle adolescents tend to experience future anxiety about their academic careers (Cabinet Office 2018). Hence, increased future anxiety may lead not only increased depressive symptoms but also more frequent delinquent behaviors, because they are unable to handle their anxiety about the future but instead attempt to relieve it by exhibiting aggression toward others (e.g., van Gelder et al. 2013).

Within-person models provide evidence of causal relationships between identity processes and psychosocial

problems (Papp 2004). Therefore, the information provided in this model would help to develop intervention programs at the *individual* level. This study indicated that an increase in an adolescent's feelings on ruminative exploration may lead an increase in both depressive symptoms and conduct problems. The individuals working with the students personally, such as clinicians and counselors, need to develop intervention programs that take into consideration how to decrease adolescents' ruminative exploration.

Contrary to expectations, at the within-person level, adolescents with higher scores on commitment-making and exploration in breadth did not show a decrease in the scores on depressive symptoms or conduct problems one year later. These results may support the idea that a within-person increase in ruminative exploration may be the strongest signal of identity confusion to adolescents, whereas fluctuations in their level of commitment are experienced as less problematic and less stressful (Becht et al. 2019).

Differentiating Between-Person and Within-Person Associations

At the between-person level, psychosocial problems predicted identity processes; this suggests that psychosocial problems relate to identity explorations over time at the group level. On the other hand, ruminative exploration predicted psychosocial problems at the within person-level; this suggests that if an individual experiences more ruminative exploration than usual, this person may experience more psychosocial problems later on. These results mean that identity processes and psychosocial problems are intricately and distinctively intertwined with each other at both the between-person and within-person levels, and thus, support the argument that between-person and within-person approaches can capture distinctive developmental processes (e.g., Mercer et al. 2017). If researchers are primarily interested in how individuals are situated within the sample and which individuals are vulnerable to score high on ruminative exploration as compared to their agemates, the findings from the between-person level may be useful. On the other hand, if researchers explore the development at the individual-level, the findings from the within-person level may be useful. Regarding intervention programs, as between-person refers to the rank-order relative to the rest of the sample and within-person refers to the intra-individual changes and fluctuations, practitioners could develop intervention programs by choosing the most appropriate way for themselves while being careful the distinction between between-person and within-person.

In understanding or supporting the future-oriented identity of adolescents, it is crucial to consider the national situation, because the meaning of future for early and middle adolescents may vary globally. For early and middle adolescents in Japan, considering about their own future entails a strong academic career because they believe that entering a prestige school and university guarantees one's success in life, including obtaining a permanent and secure job in a prestigious company (National Institution for Youth Education 2015; see also Sugimura and Mizokami 2012). In fact, most early and middle adolescents exhibit anxiety about their studies (Cabinet Office 2018). Therefore, both in research and intervention programs in Japan, such features of academic development at this stage of life should be considered.

Limitations and Suggestions for Future Research

This study is not without limitations. First, identity processes and psychosocial problems were assessed using self-reports. Identity processes are subjective, hence self-reports are the most suitable procedure. Nevertheless, to provide strong evidence, future research should include other-reported measures to corroborate the obtained findings. Second, this study focused on depressive symptoms and conduct problems in psychosocial problems. Future research should test the other psychosocial problems, such as anxiety, aggression, and delinquency. Third, in this study, the five-dimensional model that originated from identity status research was used; however, the focus was on only future domain even though there are multiple identity domains such as friendship, education (Meeus et al. 2010), and religion (Sugimura et al. 2018). In order to understand identity integration from the various domains, it would be important to investigate the association between identity processes in other domains and psychosocial problems.

Conclusion

This study contributes substantially to the knowledge of identity formation that is interconnected with psychosocial problems. While previous research focused on identity processes in the commitment evaluation cycle, this study examined identity processes in the commitment formation cycle. This study demonstrated that exploration in breadth and ruminative exploration were predicted by depressive symptoms and conduct problems in between-person differences. Furthermore, this study unraveled that an increase in ruminative exploration predicted an increase in both depressive symptoms and conduct problems one year later. These findings highlight the characteristics of ruminative exploration as the dark side of identity formation and imply that future-oriented rumination is a critical risk factor for the acceleration of psychosocial problems. These results are expected to be applied in future research for the

development of theory, intervention programs, and methodology on identity formation in adolescence.

Compliance with Ethical Standards

References

Achenbach, T. M., Dumenci, L., & Rescorla, L. (2002). Ten-year comparisons of problems and competencies for national samples of youth self, parent, and teacher reports. *Journal of Emotional and Behavioral Disorders*, 10, 194–203. https://doi.org/10.1177/10634266020100040101.

Becht, A. I., Luyckx, K., Nelemans, S. A., Goossens, L., Branje, S. J. T., Vollebergh, W. A. M., & Meeus, W. H. J. (2019). Linking Identity and depressive symptoms across adolescence: a multisample longitudinal study testing within-person effects. *Developmental Psychology*. https://doi.org/10.1037/dev0000742.

Bogaerts, A., Claes, L., Schwartz, S. J., Becht, A. I., Verschueren, M., Gandhi, A., & Luyckx, K. (2019). Identity structure and processes in adolescence: examining the directionality of between- and within-person associations. *Journal of Youth and Adolescence*, 48, 891–907. https://doi.org/10.1007/s10964-018-0931-5.

Brinton, M. C. (2011). *Lost in transition: youth, work, and instability in postindustrial Japan*. New York, NY: Cambridge University Press. https://doi.org/10.1017/CBO978051176274.

Cabinet Office (2018). *Dai yonkai hikou geiin ni kansuru sougouteki kenkyuu chosa* [International Survey of Youth Attitude 2018]. https://www8.cao.go.jp/youth/english/survey/2018/pdf/part2-1.pdf.

Crocetti, E., Beyers, W., & Çok, F. (2016). Shedding light on the dark side of identity: Introduction to the special issue. *Journal of Adolescence*, 47, 104–108. https://doi.org/10.1016/j.adolescence.2016.01.002.

Crocetti, E., Rubini, M., & Meeus, W. (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. https://doi.org/10.1016/j.adolescence.2007.09.002.

Durbin, C. E., & Hicks, B. M. (2014). Personality and psychopathology: a stagnant field in need of development. *European Journal of Personality*, 28, 362–386. https://doi.org/10.1002/per.1962.

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

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

Hamaker, E. L., Kuiper, R. M., & Grasman, R. P. (2015). A critique of the cross-lagged panel model. *Psychological Methods*, 20, 102–116. https://doi.org/10.1037/a0038889.

Hatano, K., Sugimura, K., Crocetti, E., & Meeus, W. (2019). Diverse-and-dynamic pathways in educational and interpersonal identity formation during adolescence: longitudinal links with psychosocial functioning. *Child Development*. https://doi.org/10.1111/cdev.13301.

Klimstra, T. A., & Denissen, J. J. A. (2017). A theoretical framework for the associations between identity and psychopathology. *Developmental Psychology*, 53, 2052–2065. https://doi.org/10.1037/dev0000356.

Kline, R. B. (2010). *Principles and practice of structural equation modeling*. 3rd ed. New York, NY: Guilford Press.

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. https://doi.org/10.1080/01621459.1988.10478722.

Lerner, R. M., Theokas, C., & Jelicic, H. (2005). Youth as active agents in their own positive development: A developmental systems perspective. In W. Greve, K. Rothermund, & D. Wentura (Eds.), *The adaptive self: personal continuity and intentional self-development* (pp. 31–47). Göttingen, Germany: Hogrefe & Huber.

Luyckx, K., Klimstra, T. A., Duriez, B., Schwartz, S. J., & Vanhalst, J. (2012). Identity processes and coping strategies in college students: short-term longitudinal dynamics and the role of personality. *Journal of Youth and Adolescence*, 41, 1226–1239. https://doi.org/10.1007/s10964-012-9753-z.

Luyckx, K., Gandhi, A., Bijttebier, P., & Claes, L. (2015). Non-suicidal self-injury in high school students: Associations with identity processes and statuses. *Journal of Adolescence*, 41, 76–85. https://doi.org/10.1016/j.adolescence.2015.03.003.

Luyckx, K., Goossens, L., & Soenens, B. (2006). A developmental contextual perspective on identity construction in emerging adulthood: change dynamics in commitment formation and commitment evaluation. *Developmental Psychology*, 42, 366–380. https://doi.org/10.1037/0012-1649.42.2.366.

Luyckx, K., Klimstra, T., Duriez, B., Van Petegem, S., & Beyers, W. (2013). Personal identity processes from adolescence through the late twenties: age trends, functionality, and depressive symptoms. *Social Development*, 22, 701–721. https://doi.org/10.1111/sode.12027.

Luyckx, K., Schwartz, S. J., Berzonsky, M., Soenens, B., Vansteenkiste, M., Smits, I., & Goossens, L. (2008). Capturing ruminative exploration: extending the four-dimensional model of identity formation in late adolescence. *Journal of Research in Personality*, 42, 58–82. https://doi.org/10.1016/j.jrp.2007.04.004.

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

Marcia, J. E. Identity and psychotherapy. In S. L. Archer (Ed.) (1994). Interventions for adolescent identity development (pp. 29–46). Thousand Oaks, CA: Sage.

Meeus, W. H. J. (2016). Adolescent psychosocial development: a review of longitudinal models and research. *Developmental Psychology*, 52, 1969–1993. https://doi.org/10.1037/dev0000243.

Meeus, W. H. J. (2018). *Adolescent development: longitudinal research into the self, personal relationships, and psychopathology*. London: Routledge.

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. https://doi.org/10.1111/j.1467-8624.2010.01492.x.

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

Ministry of Education, Culture, Sports, Science and Technology (2017). Heisei nijyuu kyuu nendo jido seito no mondai koudou futoukou nado seito sidoujyou no syokadai ni kannsuru chosa kekka ni tuite [Survey on problems behaviors and tasks of student guidance in 2017]. http://www.mext.go.jp/b_menu/houdou/30/10/1410392.htm.

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

Nakama, R., Sugimura, K., Hatano, K., Mizokami, S., & Tsuzuki, M. (2014). Tajigenteki identity hattatsu shakudo (DIDS) niyoru identity hattatsu no kentou to ruikeika no kokoromi [Researching identity development and statuses with the dimensions of identity development scale: The Japanese version]. *Japanese Journal of Psychology*, 85, 549–559. https://doi.org/10.4992/jjpsy.85.13074.

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.

Nurmi, J. E. (1991). How do adolescents see their future? A review of the development of future orientation and planning. *Developmental Review*, 11, 1–59. https://doi.org/10.1016/0273-2297(91)90002-6.

Papp, L. M. (2004). Capturing the interplay among within and between person processes using multilevel modeling techniques. *Applied & Preventive Psychology*, 11, 115–124. https://doi.org/10.1016/j.appsy.2004.09.002.

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.

Rosenthal, D. A., Gurney, R. M., & Moore, S. M. (1981). From trust to intimacy: a new inventory for examining Erikson's stages of psychosocial development. *Journal of Youth and Adolescence*, 10, 525–537. https://doi.org/10.1007/BF02087944.

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

Schwartz, S. J., Beyers, W., Luyckx, K., Soenens, B., Zamboanga, B. L., Forthun, L. F., & Waterman, A. S. (2011). Examining the light and dark sides of emerging adults' identity: a study of

identity status differences in positive and negative psychosocial functioning. *Journal of Youth and Adolescence*, 40, 839–859. https://doi.org/10.1007/s10964-010-9606-6.

Schwartz, S. J., Klimstra, T. A., Luyckx, K., Hale, W. W., & Meeus, W. H. J. (2012). Characterizing the self-system over time in adolescence: internal structure and associations with internalizing symptoms. *Journal of Youth and Adolescence*, 41, 1208–1225. https://doi.org/10.1007/s10964-012-9751-1.

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*, 48, 668–679. https://doi.org/10.1007/s10964-018-0920-8.

Sugimura, K., & Mizokami, S. (2012). Personal identity in Japan. *New Directions for Child and Adolescent Development*, 138, 123–143. https://doi.org/10.1002/cad.20025.

Statistics Bureau of Japan (2018). Gakkou kihon chousa [School Basic Survey]. 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. https://doi.org/10.1027/1016-9040/a000334.

van Gelder, J. L., Hershfield, H. E., & Nordgren, L. F. (2013). Vividness of the future self predicts delinquency. *Psychological Science*, 24, 974–980. https://doi.org/10.1177/0956797612465197.

Waterman, A. S., Schwartz, S. J., Hardy, S. A., Kim, S. Y., Lee, R. M., Armenta, B. E., & Agocha, V. B. (2013). Good choices, poor choices: relationship between the quality of identity commitments and psychosocial functioning. *Emerging Adulthood*, 1, 163–174. https://doi.org/10.1177/2167696813484004.

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