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EMPIRICAL RESEARCH

Identity Processes and Intrinsic and Extrinsic Goal Pursuits: Directionality of Effects in College Students

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Abstract Identity research has mainly focused on the degree to which adolescents and emerging adults engage in exploration and commitment to identity goals and strivings. Somewhat lacking from this research tradition is an explicit focus on the content of the identity goals that individuals deem important and pursue. The present manuscript describes two longitudinal studies sampling college students in which we examine how exploration and commitment processes relate to intrinsic and extrinsic goal pursuits as defined in Self-Determination Theory. Study 1 was a two-wave longitudinal study spanning 6 months ($N = 370$; 77.4% women; mean age 18.24 years); Study 2 was a three-wave longitudinal study spanning 6 months ($N = 458$ students; 84.9% women; mean age 18.25 years). Using cross-lagged path analyses, hypotheses were supported to various degrees of convergence between studies, pointing to the extent of which results were replicated across our two independent longitudinal samples. Whereas an intrinsic goal orientation positively predicted commitment making (Study 1) and identification with commitment over time (Studies 1 and 2), an extrinsic goal orientation positively predicted ruminative exploration over time, which led to decreases in intrinsic orientation over time (Study 2). Further, an intrinsic goal orientation negatively predicted ruminative exploration over time (Study 1). The findings in for pro-active exploration processes were inconsistent across both studies, being prospectively related to both intrinsic (Study 2) and extrinsic goal orientations (Study 1). Implications and suggestions for future research are discussed.

Keywords Identity · Commitment · Exploration · Intrinsic and extrinsic goals · Longitudinal · College students

Introduction

Adolescence constitutes a key period for developing one's sense of identity (Erikson 1968). Successful identity development (referred to as identity synthesis by Erikson) involves the reworking of childhood identifications into a larger and self-determined set of ideals and goals. However, if an individual fails to identify with life goals, he or she is more vulnerable to experiencing identity confusion by the end of adolescence. At the time of Erikson's writings, religious values and institutional goals often served as the basis for identity synthesis (Baumeister 1987). However, the modern transition from adolescence to adulthood is more extended and diversified than 50 years ago, partially due to social and economic changes and the removal of traditional markers of adulthood (Côté and Bynner 2008). Arnett (2000) argued that, especially in current industrialized societies, the age period of the late teens and the twenties constitutes a distinct developmental period demographically, subjectively, and in terms of identity exploration and goal setting for the future (Luyckx et al. 2010; Montgomery and Côté 2003; Niemiec et al. 2009).

In Belgium, the country where the present studies were conducted, this transition has become increasingly

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individualized as well, such that young people must define for themselves which goals they want to explore and live up to (Duriez et al. 2012; Schwartz et al. 2013). As detailed in Luyckx et al. (2008), the postponement of traditional adult roles such as the completion of schooling, marriage, childbearing, and becoming financially independent are clearly visible in today's Belgian society. Further, ever since the 1950s and 1960s, the influence of societal institutions such as the church and the government on one's individual life path has decreased substantially (Klimstra et al. 2013). For instance, church attendance in Belgium has dropped from 43% in 1967 to 5% in 2009 (Havermans and Hooghe 2011). As a result of these changes, personal identity formation has become a challenging developmental task in which emerging adults have to choose from many life paths and different life goals. Luyckx et al. (2013) have indeed shown that in Belgium identity exploration seems to be at its peak in the early twenties. This indicates that emerging adulthood seems to be a period in life in which identity work and goal setting are highly salient aspects of daily life.

However, when looking at identity literature for this life period, most neo-Eriksonian research has focused on the processes through which individuals construct their identity (i.e., exploration and commitment) while neglecting to examine exactly which goals they are pursuing in this process (i.e., the content of their identity strivings). Further, prospective studies examining how identity processes and content develop and potentially influence one another over time are even scarcer (Duriez et al. 2012). The present manuscript describes two longitudinal studies of college students in which we examine how different exploration and commitment processes (as forwarded in the model developed by Luyckx et al. 2008) relate to intrinsic and extrinsic goal pursuits as defined in Self-Determination Theory (SDT; Deci and Ryan 2000), a broad-based motivation theory which endorses the role of goal pursuits in human behaviour and decision-making.

Identity Processes

Based on Erikson's (1968) seminal writings, Marcia (1966) developed the identity status paradigm and delineated two key identity processes at the core of these identity types or statuses: *exploration,* or experimenting with identity alternatives; and *commitment,* or adhering to a set of goals and values. These processes constitute the tools with which adolescents engage themselves in their identity quest. Based on these two dimensions, Marcia distinguished among four identity statuses, describing how individuals deal with the identity challenge at a certain point in time: achievement (characteristic of individuals having strong identity commitments after a period of profound exploration), foreclosure (characteristic of individuals having made identity commitments without previous exploration), moratorium (characteristic of individuals who are still exploring and did not make strong identity commitments yet), and diffusion (characteristic of individuals who are not profoundly exploring and who do not have strong guiding commitments).

Marcia's model has inspired decades of empirical work (Kroger and Marcia 2011). Over the last decade, several researchers have proposed more refined models in which exploration and commitment have been broken down into a larger set of processes. In one such model, Luyckx et al. (2006) distinguished among four processes subsumed under two complementary cycles. The first cycle (the identity *formation* cycle) builds on Marcia's (1966) work and captures the processes through which individuals explore alternatives and make commitments. This first cycle is described in terms of two processes: *exploration in breadth,* or the purposeful exploration of various alternatives, and *commitment making*, or the adherence to a set of choices. The second identity cycle (the identity *evaluation* cycle) captures the processes through which individuals re-evaluate their identity choices and assess the degree to which they feel certain about these choices. This second cycle is also described in terms of two processes: *exploration in depth,* or the evaluation of current commitments, and *identification with commitment*, or the degree to which these commitments become integrated in the individual's sense of self. In a typical developmental trajectory, adolescents may gather information about different identity alternatives (exploration in breadth), followed by the making of actual choices about important life issues (commitment making). Subsequently, they may evaluate the degree to which these identity choices correspond with their personal internal standards (exploration in depth) and, as a consequence, identify with or feel certain about these commitments (identification with commitment).

In line with Marcia's (1980) model, this four-dimensional model generally assumes that exploration is beneficial. However, as contemporary societies have become increasingly individualistic and provide less support for young people, individuals may become stuck in their identity search and experience considerable difficulty enacting commitments (Schwartz et al. 2005). Consequently, *ruminative exploration* was added as a fifth process and was conceptualized as a process that hinders identity development. Partially troubled by what they perceive as inadequate progress toward personally important goals, individuals scoring high on ruminative exploration experience difficulty settling on satisfying choices and keep asking themselves the same questions, resulting in feelings of uncertainty and incompetence (Luyckx et al. 2008). Research on adolescents and emerging adults has demonstrated that ruminative exploration, in contrast to the other

exploration processes, was associated with lowered well-being (Luyckx et al. 2008).

The Role of Intrinsic and Extrinsic Goal Pursuits

Most research on the content of identity formation has focused on specific identity domains and examined similarities and differences in identity formation within these specific domains (e.g., Luyckx et al. 2014). However, some recent studies (mainly from an identity style perspective; Berzonsky 2011) took a more integrative approach and focused on the content or quality of the identity goals upheld, or the degree to which intrinsic vs. extrinsic goals are pursued (e.g., Berzonsky et al. 2011; Duriez et al. 2012). This distinction between intrinsic and extrinsic goal pursuits has been proposed within SDT, a motivational theory that endorses the role of a set of basic psychological needs in determining human behavior and decision-making (Deci and Ryan 2000; Kasser and Ryan 1996). SDT and neo-Eriksonian identity theorizing converge on the meta-theoretical tenet that humans are pro-active organisms acting on their inner and outer environments to develop a more unified sense of self, providing the core of a healthier and more integrated functioning (Ryan and Deci 2002). Within SDT, the notion of intrinsic vs. extrinsic goal pursuit refers to the degree to which goals relate to (or are likely to impede) the fulfilment of the basic needs of autonomy, competence, and relatedness (Ryan and Deci 2002). Intrinsic life goals such as self-development, community contribution, and social affiliation are believed to be congruent with basic need satisfaction and have been found to predict self-actualisation, well-being, and optimal functioning. However, extrinsic life goals such as pursuing fame, wealth, or physical attractiveness are considered to be unrelated or even negatively related to basic need satisfaction and have been found to negatively predict well-being and mental health (Deci and Ryan 2000; Duriez et al. 2012).

In one of the first longitudinal studies examining the link between intrinsic and extrinsic goal pursuits and identity styles (stylistic differences in how individuals approach and deal with identity-relevant tasks and challenges, and mainly the identity exploration process as forwarded in the status paradigm; Berzonsky 1990), Duriez and colleagues (2012) found evidence for a reciprocal model with goal content and identity styles mutually influencing one another over time. The normative identity style (typical of individuals who rigidly preserve their commitments at the cost of being open-minded and exploring alternatives, much like the individuals in Marcia's foreclosure status) was found to predict relative increases in extrinsic (relative to intrinsic) goal pursuits. Conversely, having more extrinsic relative to intrinsic goal pursuits predicted relative decreases in the information-oriented style (typical of individuals who

actively explore and evaluate personally relevant information, much like the individuals in Marcia's achievement and moratorium statuses) and relative increases in the diffuse-avoidant style (typical of individuals who avoid dealing with identity issues until situational demands dictate that they do so, much like the individuals in Marcia's diffusion status).

Although this study can serve as a guide, no study to date has linked these goal pursuits to various commitment and exploration processes over time. Such an extension into identity processes is important because, although identity styles assess how individuals generally approach identity issues, they do not capture the extent to which individuals are engaging in identity work at a certain point in time. Further, this previous study did not focus on how commitment processes were related to these goal pursuits, despite that commitment constitutes a crucial factor on the road to achieving identity synthesis. Luyckx and colleagues (2009) already demonstrated important reciprocal associations between need satisfaction (closely related to intrinsic and extrinsic goal pursuits), and exploration and commitment processes. Need satisfaction is positively related to commitment processes and pro-active exploration and negatively to ruminative exploration over time. In sum, indirect longitudinal evidence linking (a) identity styles to goal pursuits, (b) as well as exploration and commitment processes to need satisfaction, indicates the necessity of researching how commitment and exploration processes, and intrinsic vs. extrinsic goal orientations are related to one another over time.

Research Objectives and Hypotheses

Two longitudinal studies were conducted to examine the directionality of effects in the prospective associations linking identity processes and content. In line with previous studies examining related research questions, we expect identity processes and goal pursuits to mutually influence one another over time, indicative of a transactional system on the pathway to self-development. For the commitment processes, we generally expected that an intrinsic goal orientation would relate positively to commitment making and especially to identification with commitment. With respect to extrinsic goal orientation, our expectations were less clear, as individuals pursuing extrinsic goals could potentially make identity commitments based on the pursuit of financial success, fame, or physical attractiveness. However, due to the fact that such extrinsic goal pursuits may impede the satisfaction of one's basic psychological needs (Ryan and Deci 2002), we expected that when looking at unique associations, extrinsic goal pursuits would

be less strongly related to identification with commitment as compared to intrinsic goal pursuits.

For the exploration processes, we generally expected that especially an intrinsic goal orientation (unlike an extrinsic goal orientation) would relate positively to exploration in breadth and exploration in depth. Individuals pursuing intrinsic goals, more so than individuals pursuing extrinsic goals (Deci and Ryan 2000), are geared toward self-development, and therefore may make use of an open-ended search for relevant identity information, which is more likely to result in a well-differentiated and integrated identity (Duriez et al. 2012; Kasser and Ryan 1996; Sheldon and Elliot 1999). As such, exploration in breadth and in depth can be seen as important tools in pro-actively striving for a life oriented toward intrinsic goals. Further, an extrinsic goal orientation would generally relate positively and an intrinsic goal orientation negatively to ruminative exploration. Engaging in ruminative exploration is indicative for individuals who do not feel certain about the identity options at hand, and consequently continue to worry and ruminate over which alternative would suit them best. Given that an extrinsic goal orientation is at odds with profound self-development, due to the focus on external goods instead of inner growth, we expect these individuals to rely less on their inner compass and more on societal pressures to guide them through life (Assor 2012; Vansteenkiste and Soenens 2015), possibly playing into ruminative exploration over time (Thomsen et al. 2011). Conversely, an extended process of ruminative exploration or being stuck in a ruminative state has been shown to impede need satisfaction over time and may lead to poorer internalisation of goals (Luyckx et al. 2009; Thomsen et al. 2011), which may push individuals into the direction of pursuing extrinsic goals as some sort of need substitute (Deci and Ryan 2000). When individuals feel insecure about their identity, they may be oriented more toward extrinsic goals because such goals may provide immediate relief from identity uncertainty. However, such relief is bound to be rather short-lived, further increasing one's identity insecurity and rumination (Schmuck et al. 2000; Soenens and Vansteenkiste 2011).

Study 1

Study 1 constituted a first test of our hypotheses. A sample of college students was assessed twice during a single academic year. We expected positive, bidirectional associations linking an intrinsic goal orientation to commitment processes (and especially identification with commitment), exploration in breadth, and exploration in depth. An intrinsic goal orientation would also negatively relate to ruminative exploration. Bidirectional associations linking

an extrinsic goal orientation to ruminative exploration were expected as well.

Methods

Participants and procedure

Data were collected at a large university (mainly attracting Caucasian students from certain socio-cultural backgrounds as based on indicators such as parental educational level and ethnicity; Glorieux et al. 2015) in the Dutch-speaking part of Belgium. The first wave was conducted in the fall-semester of 2008 and individuals participated in two measurement waves during a single academic year, 6 months apart. At Time 1, all participants were first-year bachelor students from the Faculty of Psychology and Educational Sciences. Both assessments were organised as collective testing sessions for which students received course credit. Our sample was comprised of 370 students, of whom 77.4% were women; 94% of participants were Caucasian. Mean age at T(ime)1 was 18.24 years (SD = 1.27; range 17–30 years). At T2, 341 of them participated again. In total, 4.2% of the data at the scale level was missing. Participants with and without complete data were compared using Little's (1988) Missing Completely At Random (MCAR) test which was non-significant, χ^2 (35) = 38.29, p = .32. Accordingly, we used the full information maximum likelihood (FIML) procedure provided in Mplus 6.0 (Muthén and Muthén 2002) in the path analysis. This procedure uses all available information (including information from participants with missing data) to estimate the model parameters (Enders 2010).

Measures

Identity processes

Identity processes were assessed using the Dimensions of Identity Development Scale (DIDS), which has been shown to be valid and reliable (Luyckx et al. 2008). Each identity process was measured by five items on a 5-point Likert-type scale, ranging from 1 ("*strongly disagree*") to 5 ("*strongly agree*"). Sample items read: "I have decided on the direction I want to follow in my life" (commitment making), "I sense that the direction I want to take in my life will really suit me" (identification with commitment), "I regularly think over a number of different plans for the future" (exploration in breadth), "I regularly talk with other people about the plans for the future I have made for myself" (exploration in depth), and "It is hard for me to stop thinking about the direction I want to follow in my life" (ruminative exploration). Cronbach's alphas ranged between .77 and .84 at T1, and between .83 and .92 at T2.

Table 1 Descriptive statistics for the study variables in studies 1–2

Variable	Study 1		Study 2		
	M (SD) T1	*M* (SD) T2	*M* (SD) T1	*M* (SD) T2	*M* (SD) T3
1. Intrinsic goal pursuit	4.20 (0.48)	4.21 (0.43)	4.40 (0.41)	4.20 (0.40)	4.22 (0.42)
2. Extrinsic goal pursuit	3.29 (0.63)	3.27 (0.57)	3.30 (0.66)	3.17 (0.58)	3.13 (0.61)
3. Commitment making	3.44 (0.65)	3.68 (0.82)	3.73 (0.84)	3.59 (0.82)	3.58 (0.81)
4. Identification commitment	3.43 (0.64)	3.63 (0.64)	3.50 (0.73)	3.52 (0.71)	3.52 (0.75)
5. Exploration in breadth	3.38 (0.69)	3.52 (0.72)	3.72 (0.68)	3.49 (0.75)	3.55 (0.79)
6. Exploration in depth	3.17 (0.68)	3.37 (0.74)	3.53 (0.67)	3.32 (0.76)	3.39 (0.77)
7. Ruminative exploration	2.74 (0.71)	2.71 (0.76)	2.82 (0.86)	2.84 (0.87)	2.84 (0.92)

T time, *M* mean, *SD* standard deviation

Goal pursuits

Intrinsic and extrinsic goal pursuits as conceptualized in SDT were assessed using the Dutch version (Duriez et al. 2007) of the Aspiration Index (AI; Kasser and Ryan 1996). Participants rated to what extent they attached importance to the extrinsic values of financial success, image/physical attractiveness, and fame (e.g., "It is important to me to be financially successful in life"). They also rated to what extent they attached importance to the intrinsic values of growth, community contribution, and affiliation (e.g., "It is important for me to try to do things that improve society"). Both scales were measured with six items and we computed total scores for extrinsic and intrinsic goal pursuit by averaging these six items. Cronbach's alphas for extrinsic and intrinsic goal pursuit were .81 and .79 at T1, and .78 and .73 at T2.

Results and Brief Discussion

Preliminary descriptive analyses

Preliminary descriptive and correlational analyses were conducted in SPSS version 23, using the expectation maximization (EM) algorithm to estimate missing data (as EM parameter estimates are less biased than those estimated with ad hoc procedures such as listwise deletion; Schafer and Graham 2002). This approach allowed us to include all participants in the first set of analyses. Table 1 presents descriptive statistics at both time-points. Using one-way multivariate analysis of variance (MANOVA) with all study variables at T1 as dependent variables, no multivariate effect of gender was found, Wilks' $\lambda = .97$; $F (7, 360) = 1.52$; $p = .16$. However, follow-up univariate analyses revealed that women scored higher than men on exploration in depth, $M = 3.22$, $SD = 0.67$; and $M = 3.04$, $SD = 0.69$, respectively; $F (1, 366) = 4.77$; $p < .05$.

Table 2 Within-time correlations in study 1 ($N = 371$)

	2.	3.	4.	5.	6.	7.
1. Intrinsic	.24***	.11*	.23***	.24***	.23***	.00
	.16**	.10	.21***	.23***	.21***	.01
2. Extrinsic		−.03	.04	.16**	.07	.09
		.05	.07	.24***	.20***	.08
3. CM			.66***	.29***	.43***	−.41***
			.73***	.47***	.41***	−.44***
4. IC				.42***	.53***	−.31***
				.52***	.46***	−.33***
5. EB					.66***	.29***
					.68***	.08
6. ED						.17**
						.16**
7. RE						–
						–

*Note.* The first coefficient is for Time 1, the second for Time 2

CM commitment making, *IC* identification with commitment, *EB* exploration in breadth, *ED* exploration in depth, *RE* ruminative exploration

*p < .05; **p < .01; ***p < .001

Correlational analyses

With respect to the associations with age at T1, age was positively related to identification with commitment ($r = .12$, $p < .05$) and exploration in breadth at T1 ($r = .11$, $p < .05$). Further, all correlations among the study variables at both time-points are presented in Table 2. Intrinsic goal pursuit was consistently and positively related to identification with commitment, exploration in breadth, and exploration in depth. Extrinsic goal pursuit was positively related to exploration in breadth and, less consistently, to exploration in depth.

Fig. 1 Standardized auto-regressive and cross-lagged path coefficients for Study 1. Only significant structural path coefficients are displayed. Within-time correlations, paths from gender and age, and cross-lagged paths among the identity processes are not presented for reasons of clarity. *$p < .05$; **$p < .01$; ***$p < .001$
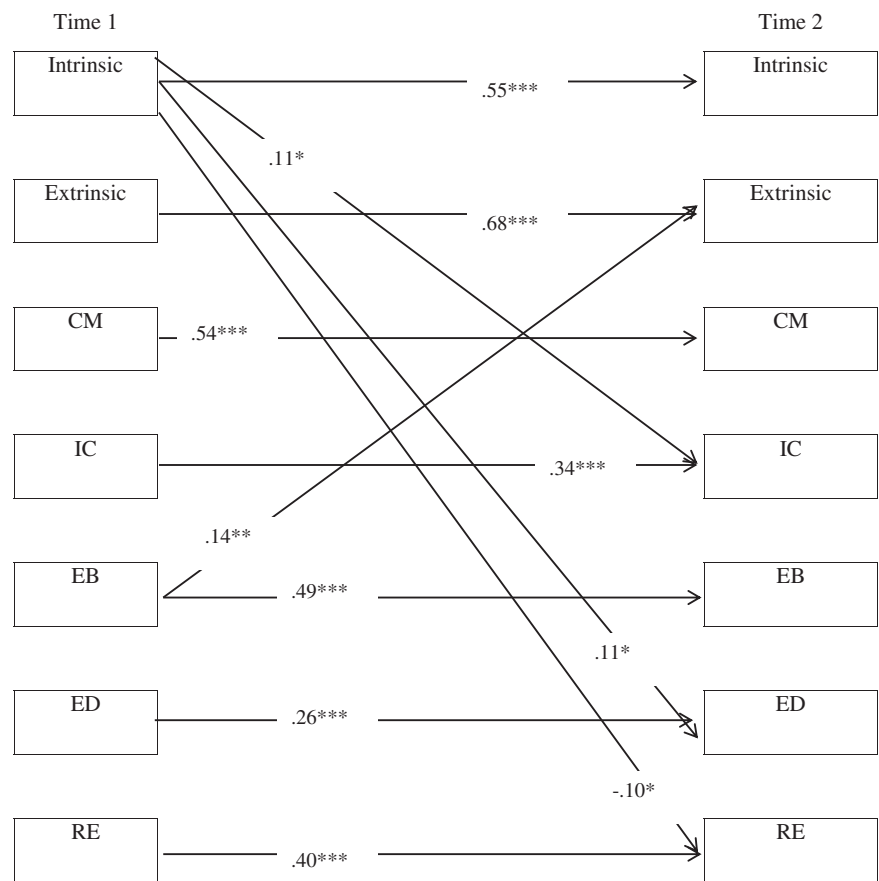
Cross-lagged analyses

Cross-lagged path analyses with manifest variables using Structural Equation Modeling (SEM) were conducted in MPLUS 6 (Muthén and Muthén 2002). In the models being tested, all within-time associations at Times 1–2, all auto-regressive paths, and all cross-lagged effects linking identity to goals (and vice versa) were estimated. Further, gender and age were controlled for by estimating paths to each of the constructs in the model (Bollen 1989). Finally, all lagged effects among the identity processes were included as well (cf., Cole and Maxwell 2003; Reichardt 2002). To evaluate model fit, we used the chi-squared index, which should be as small as possible; the Root Mean Square Error of Approximation (RMSEA), which should be less than .08, and preferably .06, for adequate fit; the Standardized Root Mean Square Residual (SRMR), which should be less than .10; and the Comparative Fit Index (CFI), which should exceed .90, and preferably .95 (Hu and Bentler 1999; Kline 2005).

The path model estimated did not provide an adequate fit to the data across all indices, χ^2 (2) = 13.84, $p < .001$; RMSEA = .127; CFI = .995; SRMR = .024. To make the model more parsimonious, all non-significant paths from

age and gender to the study variables were trimmed, χ^2 (24) = 35.212, $p = .07$; RMSEA = .036; CFI = .995; SRMR = .033. Figure 1 displays all significant standardized auto-regressive and cross-lagged paths from identity processes to intrinsic and extrinsic goal pursuits, and vice versa. As expected, bidirectional associations linking identity processes to intrinsic and extrinsic goal pursuits were obtained. An intrinsic goal pursuit positively predicted identification with commitment and exploration in depth, and negatively predicted ruminative exploration. However, contrary to expectations, exploration in breadth positively predicted an extrinsic goal pursuit.

Multi-group cross-lagged analyses were conducted to assess whether the cross-lagged paths would differ between males and females, so in these analyses gender was included as a potential moderator of the cross-lagged coefficients obtained (instead of a control variable as in the previous set of analyses). A constrained model (with all coefficients set equal across gender) was compared with an unconstrained model (with all coefficients allowed to vary across gender). The null hypothesis of invariant path coefficients across gender would be rejected if at least two of the following criteria were satisfied (Cheung and Rensvold 2002; Vandenberg and Lance 2000): $\Delta\chi^2$ significant at $p < .05$;

ΔCFI $\geq$ .01; and ΔRMSEA $\geq$ .015. Invariance tests indicated that no significant differences emerged between the models, $\Delta\chi^2$ (40) = 39.56, p = .49; ΔCFI < .01; ΔRMSEA < .015, favoring the more parsimonious constrained model. Consequently, we could conclude that cross-lagged paths applied equally well to males and females.

Study 2

In Study 2, college students were sampled again and we re-examined our study hypotheses using a more elaborate longitudinal design as compared to Study 1. More specifically, three waves of longitudinal data (with 3-month time intervals in-between) were used in answering our research questions, so the effects could be replicated across two time intervals, increasing both the reliability and the validity of the cross-lagged estimates (Orth et al. 2008). To summarize, our initial hypotheses stated that an intrinsic goal orientation would be positively related to pro-active exploration and commitment processes (and especially identification with commitment) and negatively to ruminative exploration over time, whereas an extrinsic goal orientation would be positively related to ruminative exploration over time. Whereas Study 1 partially confirmed our hypothesis with respect to intrinsic goal pursuits, our hypothesis with respect to extrinsic goal orientation was disconfirmed. Furthermore, contrary to expectations, we found exploration in breadth positively predicting an extrinsic goal orientation over time. Hence, Study 2 was conducted to replicate our Study 1 findings and to determine whether this prospective association linking exploration in breadth to extrinsic goal orientation would be sample-specific or would again be found in an independent sample of college students.

Methods

Participants and procedure

Data were collected at the same university as in Study 1. The first wave was conducted in the fall-semester of 2009 and individuals participated in three measurement waves during a single academic year, each 3 months apart. At T1, all participants were first-year bachelor students from the Faculty of Psychology and Educational Sciences. Our Time 1 assessment was organised as a collective testing session for which students received course credit. At Times 2–3, students completed questionnaires at home and returned the completed questionnaires in a sealed envelope to the researchers. Our sample was comprised of 458 students, of whom 84.9% were women; 94% of participants were Caucasian. Mean age at T1 was 18.25 years (SD = 0.97; range 17–24 years). At T2 and T3, respectively, 410 and

391 individuals participated again. In total, 9.3% of the data at the scale level was missing. Participants with and without complete data were compared using Little's (1988) MCAR test, which was significant, χ^2 (81) = 109.67, $p < .05$. However, the non-normed χ^2 was 1.35, indicating that data were most likely to be missing at random. Accordingly, as in Study 1, we used FIML to deal with missing data in the path analysis.

Measures

Similar to Study 1, the DIDS was used to assess the five identity processes. Cronbach's alphas ranged between .76 and .92 at T1, between .81 and .90 at T2, and between .84 and .92 at T3. Further, intrinsic and extrinsic goal pursuits were again assessed with the AI, this time using an 18-item version with 9 items for intrinsic and 9 items for extrinsic goal pursuits. Cronbach's alphas for intrinsic and extrinsic goal pursuits were .79 and .85 at T1, .79 and .85 at T2, and .83 and .86 at T3.

Results and Brief Discussion

Preliminary descriptive analyses

Preliminary descriptive and correlational analyses were again conducted in SPSS version 23, using EM to estimate missing data. Table 1 presents descriptive statistics at both time-points. Using one-way MANOVA with all study variables at T1 as dependent variables, a marginally significant multivariate effect of gender was found, Wilks' λ = .97; F (7, 432) = 2.02; p = .05. Follow-up univariate analyses revealed that women scored higher than men on intrinsic (M = 4.41, SD = 0.40 and M = 4.30, SD = 0.48, respectively; F (1, 438) = 4.35; $p < .05$) and extrinsic goal pursuit (M = 3.31, SD = 0.65 and M = 3.10, SD = 0.68, respectively; F (1, 438) = 5.70; $p < .05$).

Correlational analyses

With respect to the associations with age at T1, age was negatively related to extrinsic goal pursuit at T1 (r = −.14, $p < .01$). Further, all correlations among the study variables at the three time-points are presented in Table 3. Intrinsic goal pursuit was consistently and positively related to commitment making, identification with commitment, exploration in breadth, and exploration in depth. Extrinsic goal pursuit was positively related to exploration in breadth and exploration in depth, and, less consistently so, to ruminative exploration.

Table 3 Within-time correlations in study 2 ($N = 458$)

	2.	3.	4.	5.	6.	7.
1. Intrinsic	.08	.17***	.11*	.15**	.13**	−.02
	.18***	.27***	.25***	.25***	.21***	.00
	.14**	.35***	.38***	.28***	.23***	−.01
2. Extrinsic		.04	.02	.13**	.17***	.05
		.01	−.02	.20***	.17***	.20***
		.06	.08	.12**	.19***	.18***
3. CM			.75***	.29***	.45***	−.46***
			.69***	.41***	.37***	−.40***
			.78***	.46***	.42***	−.47***
4. IC				.24***	.44***	−.53***
				.40***	.45***	−.40***
				.54***	.55***	−.37***
5. EB					.49***	.14**
					.66***	.30***
					.68***	.15**
6. ED						−.05
						.21***
						.15**
7. RE						–
						–
						–

Note. The first coefficient is for Time 1, the second for Time 2, the third for Time 3

CM commitment making, *IC* identification with commitment, *EB* exploration in breadth, *ED* exploration in depth, *RE* ruminative exploration

*p < .05; **p < .01; ***p < .001

Cross-lagged analyses

As in Study 1, cross-lagged path analyses with manifest variables using SEM was used to examine the directionality of effects, with all synchronous or within-time associations, all auto-regressive paths, and all cross-lagged effects linking identity to goals (and vice versa) between adjacent measurement times being included. In addition, auto-regressive paths from T1 to 3 were included as well. Gender and age were again controlled for in all models. Finally, all lagged effects among the identity processes were included. Path analyses then proceeded in two steps. In the first cross-lagged model, the cross-lagged paths were freely estimated. This model provided an adequate fit to the data, χ^2 (46) = 83.998, $p < .001$; RMSEA = .042; CFI = .992; SRMR = .025. Similar to Study 1, to make the model more parsimonious, all non-significant paths from age and gender to the study variables were trimmed, χ^2 (82) = 116.800, $p < .01$; RMSEA = .030; CFI = .992; SRMR = .032. In the second cross-lagged model, these cross-lagged paths were

constrained to be equal across both time intervals, χ^2 (122) = 163.777, $p = .007$; RMSEA = .027; CFI = .991; SRMR = .037. Invariance tests indicated that the more parsimonious invariant model fitted the data equally well, $\Delta\chi^2$ (40) = 46.98, $p = .21$; ΔCFI < .01; ΔRMSEA < .015. Consequently, we retained this model with longitudinal constraints.

Figure 2 displays all significant standardized auto-regressive coefficients (except those from T1 to T3 which ranged between .05, *ns*, and .38, $p < .001$) and cross-lagged paths from identity processes to intrinsic and extrinsic goal pursuits, and vice versa. Again, as expected, bidirectional associations emerged. An intrinsic goal pursuit positively predicted commitment making and (similar to Study 1) identification with commitment. An extrinsic goal pursuit positively predicted ruminative exploration. With respect to the reverse direction of effects, exploration in breadth positively and ruminative exploration negatively predicted an intrinsic goal pursuit. Similar to Study 1, multi-group analyses for gender indicated all cross-lagged paths could be set equal across gender, $\Delta\chi^2$ (40) = 47.30, $p = .20$; ΔCFI < .01; ΔRMSEA < .015. Consequently, the cross-lagged paths applied equally well to males and females.

General Discussion

Previous research conducted from a neo-Eriksonian perspective has mainly focused on the identity processes at work in achieving identity synthesis and, for instance, examined the degree to which adolescents engage in exploration and commitment processes on the road to adulthood. These identity processes are considered to constitute building blocks of one's identity quest. However, somewhat lacking from this research tradition is an explicit focus on the identity goals that individuals deem important and pursue. Recent studies have suggested that these identity processes and goal contents are differentially related to one another (Berzonsky et al. 2011) and predict one another over time in meaningful ways (Duriez et al. 2012). This research is still in its infancy and has been mainly conducted using Berzonsky's (2011) identity style perspective. Using two longitudinal datasets and measures of five personal identity processes (i.e., commitment making, identification with commitment, exploration in breadth, exploration in depth, and ruminative exploration) and two qualitatively different types of goal pursuits (i.e., intrinsic and extrinsic goal pursuit), we examined cross-lagged associations linking identity processes and goal orientations. Our hypotheses were supported to various degrees of convergence between both studies.

Fig. 2 Standardized auto-regressive and cross-lagged path coefficients for Study 2. Only significant structural path coefficients are displayed. Within-time correlations, paths from gender and age, auto-regressive paths T1–T3, and cross-lagged paths among the identity processes are not presented for reasons of clarity. *p < .05; **p < .01; ***p < .001
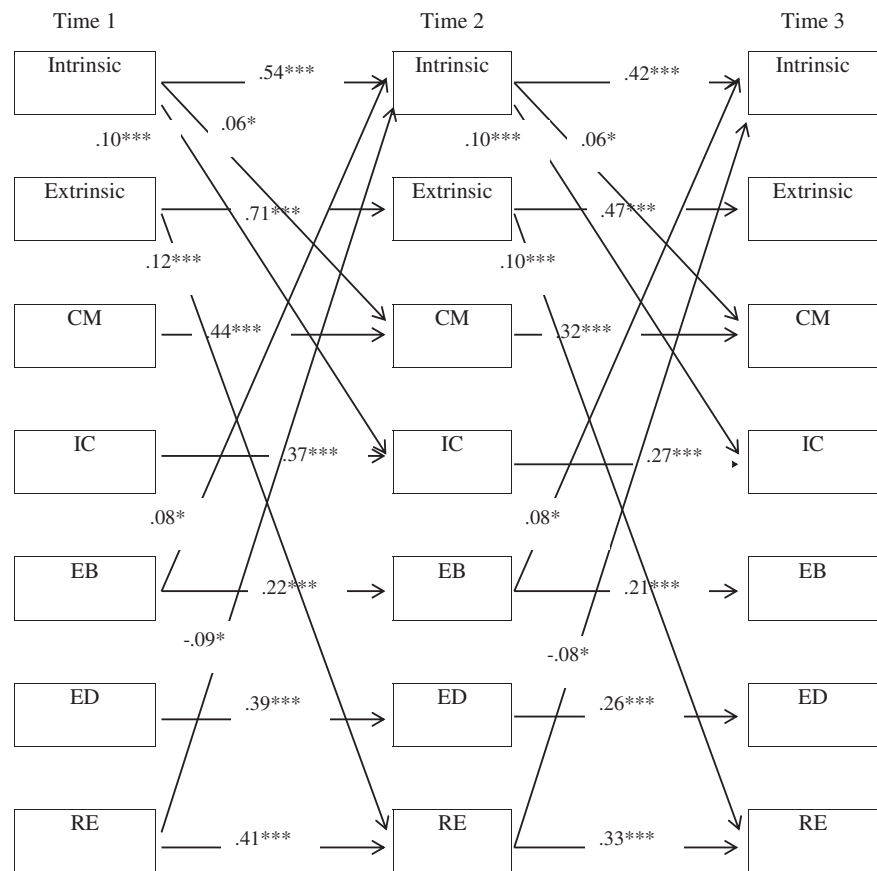
Commitment Processes and Intrinsic/Extrinsic Goal Pursuit

In line with our hypotheses, when looking at the within-time associations in both studies, especially intrinsic goal pursuit was positively related to commitment making and identification with commitment. Further, in the cross-lagged analyses, an intrinsic goal orientation consistently and positively predicted identification with commitment (both across studies and across time intervals in Study 2). In addition, in Study 2 (and across both time intervals) an intrinsic goal orientation positively predicted commitment making as well. These findings confirm our hypotheses and indicate that pursuing intrinsic goals may contribute to self-development, as it may motivate individuals to commit to and identify with these goals as core identity assets (Soenens and Vansteenkiste 2011). Although we hypothesized that extrinsic goal orientation could also be related to commitment making to a certain extent, this expectation was not confirmed, neither cross-sectionally nor longitudinally. The fact that individuals striving for extrinsic goals make their endeavours contingent upon the attainment of external signs of worth, wealth, and success (Kasser 2002), may not provide them with the certainty installed by

a strong set of identity commitments. Indeed, such extrinsic goal pursuits may distract from satisfying the basic psychological needs of autonomy, competence, and relatedness, and may prevent people from becoming fully functioning and self-determined individuals (Deci and Ryan 2000). Our findings across both studies suggested that having an intrinsic goal orientation provided individuals with the energy to invest in steady identity commitments, with which they could identify and could contribute to being autonomous, self-determined adults once they leave college and embark on their future life paths.

Interestingly, for the commitment processes, we did not find evidence for reciprocal mechanisms linking these processes to an intrinsic goal orientation. In line with the present studies, in a study by Luyckx and colleagues (2009), although need satisfaction positively predicted both commitment processes over time, reverse pathways were not found as well. Combined across these different studies, this pattern of findings seems to suggest that the interplay between striving for intrinsic goals and the degree of need satisfaction potentially emerging from this provides individuals with the energy to commit strongly to life choices and to feel certain about them (Sheldon and Elliot 1999). These results suggest that identity commitment processes should

mainly be viewed as outcomes of these motivational and goal-directed processes. In other words, intrinsic and authentic goals seem to provide a solid foundation for one's identity commitments (Assor 2012). As detailed below, and in line with the findings of Luyckx and colleagues (2009) and Duriez and colleagues (2007), the findings for identity exploration seem to tell a somewhat different and more dynamic story, characterized by the hypothesized reciprocal mechanisms. Grotevant (1987) already defined identity exploration as constituting the *work* of identity, meaning that exploration could constitute a vehicle through which individuals achieve their goals (Flum and Blustein 2000).

Exploration Processes and Intrinsic/Extrinsic Goal Pursuit

First, although we expected ruminative exploration to be positively related to an extrinsic goal orientation and negatively to an intrinsic goal orientation, these hypotheses were supported to various degrees across both studies. With respect to the within-time associations, only in Study 2 was ruminative exploration positively related to extrinsic goal pursuit. No significant associations were found between ruminative exploration and intrinsic goal pursuit. Further, when looking at the cross-lagged analyses, although results were not fully replicated across both studies, the significant findings obtained were in line with hypotheses. In Study 1, an intrinsic goal orientation negatively predicted ruminative exploration over time. Hence, when individuals tend to pursue intrinsic goals, such an orientation seems to predict relative decreases in ruminative exploration over time. In other words, intrinsically oriented individuals' preference for self-development and mutual affiliation over more extrinsically-oriented goals renders them less vulnerable for getting stuck in their identity quest. These findings complement those for the commitment processes which, as noted, demonstrated that pursuing intrinsic goals played favourably into identity commitment.

In Study 2 (and across both time intervals), we found evidence for the reverse path as well: ruminative exploration predicted relative decreases in an intrinsic goal orientation, pointing to possible reciprocal mechanisms at work. Relatedly, analyses in Study 2 indicated that an extrinsic goal orientation consistently and positively predicted ruminative exploration over time. The pattern emerging from these results needs to be emphasized as individuals who refrain from striving for intrinsic goals and engage in a ruminative exploration process may become increasingly out of touch with their inner self and increasingly experience need frustration (Luyckx et al. 2009). Striving for extrinsic goals may serve as a compensatory mechanism or need substitute in such cases (Soenens and Vansteenkiste 2011), possibly leading to the development and

maintenance of an alienated sense of self (Kasser and Ryan 1996). Relatedly, such extrinsic goal strivings have been shown to negatively play into well-being and daily functioning in the longer term as well (Deci and Ryan 2000). Hence, a detailed look at both identity processes and goal strivings at the core of one's self-system could help in identifying individuals at risk for experiencing suboptimal functioning over extended periods of time.

Second, with respect to the pro-active dimensions of exploration in breadth and in depth, results were less clear across the different analyses and studies. When looking at the within-time associations, both intrinsic and extrinsic goal pursuits were positively related to these exploration processes in both studies. When assessing prospective associations over time, divergent and somewhat unexpected findings were obtained in both studies. For exploration in breadth, mainly process-driven effects were found but, whereas in Study 1, exploration in breadth positively predicted an extrinsic goal orientation over time, in Study 2 exploration in breadth consistently and positively predicted an intrinsic goal orientation over time. Further, for exploration in depth, an intrinsic goal orientation positively predicted this exploration process over time, as expected. However, this prospective association was only obtained in Study 1.

The most intriguing finding for these two exploration processes was that exploration in breadth seemed to predict qualitatively different goals in both studies, an extrinsic goal orientation in Study 1 and an intrinsic goal orientation in Study 2. This discrepancy could be due to several reasons, two of which we will describe in more detail. First, given that Study 2 encompasses two time intervals whereas Study 1 only encompasses a single time interval, it could be argued that Study 2 generated more reliable and valid cross-lagged coefficients as compared to Study 1, given that cross-lagged coefficients could be set equal over time in Study 2 (Orth et al. 2008). Second, although longitudinal studies with multiple assessment points are generally preferred over studies encompassing only two assessment points, more substantive reasons may also have caused these seemingly discrepant findings across both studies.

One such reason could be situated in the immediate context of the participants. Hence, although the samples were quite similar in terms of age and gender distributions and were drawn from a single university, in the present studies abstraction was made of potential individual differences in the daily context encountered by these participants. Schachter and Ventura (2008), for instance, emphasized that parents need to be viewed as co-participants in adolescents' identity formation. Of specific relevance toward the link between identity processes and goal orientations, Duriez and colleagues (2012) explicitly mentioned the importance of the specific goals that are promoted by parents when interacting with their adolescent children. Research already

demonstrated that the goals promoted by parents are matched to a certain degree by the goals pursued by adolescents (e.g., Duriez et al. 2007; Soenens et al. 2015). More specifically, when adolescents are raised in a climate emphasizing extrinsic goals, adolescents' exploratory efforts might be geared especially toward these extrinsic goals. On the contrary, when adolescents are raised in a climate emphasizing intrinsic goals, adolescents' exploratory efforts might be geared especially toward these intrinsic goals. In sum, the goals being promoted by parents might act as a moderating mechanism in the link between identity processes and goal orientation. Whether or not such mechanisms could partially explain the divergent findings linking goal pursuits to identity exploration across both studies needs to be examined in future research.

Limitations and Suggestions for Future Research

The present studies also have some limitations that provide avenues for future research. First, some of the cross-lagged coefficients were rather small, but these coefficients were obtained while simultaneously controlling for all lagged effects among the identity processes, within-time associations, and autoregressive paths. Further, such relatively modest coefficients could be expected given that identity and goal pursuit are multiply determined (Luyckx et al. 2013; Swann et al. 2007).

Second, the present findings should be interpreted in light of the specific nature of the samples included, as the present studies sampled Caucasian college students originating from Belgium, being a Western-European country with a high standard of living. Although the college context has been forwarded as fertile ground for examining core identity processes and dynamics of emerging adulthood (e.g., Luyckx et al. 2006), future research should move beyond the use of such convenience samples and should include more diverse samples, paying attention to the role of the broader socio-cultural context. For instance, entering the workforce may affect many of the proposed characteristics of emerging adulthood examined in the present studies, such as goal setting, and identity exploration (Buhl 2007). The entrance into steady employment directs future goal-setting and decision-making and, hence, as compared to college students, emerging adults at work may be more inclined to make decisions on identity-related topics (Buhl 2007; Yoder 2000). Conversely, working emerging adults may be granted less time to spend on extensively exploring various alternative goals because they do not have access to the psychosocial moratorium provided by the college setting (Montgomery and Côté 2003; Yoder 2000). In sum, whether or not individuals are in college or entered the workforce already may affect the core variables—and how they are interrelated—assessed in the present studies.

Further, Arnett's (2000) notion of emerging adulthood applies primarily to individuals who have the economic wherewithal to postpone adult responsibilities. Many youth from less advantaged families and backgrounds, especially those from developing countries, have much less freedom for extended identity exploration—and as a result, they may have a much more limited set of options from which to choose (Galambos and Martínez 2007). Hence, it remains to be investigated how the different variables assessed in the present studies interrelate in non-Western cultures or in non-Caucasians living in other Western cultures, as certain cultural conditions may influence which goals emerging adults mainly pursue as well as how they tackle the identity challenge they are confronted with (Duriez et al. 2012; Schwartz et al. 2013). For instance, individual goal-setting has been a central construct in cross-cultural research for decades, with especially the distinction between individualistic and collectivistic cultures being forwarded as having a substantial influence on goal-setting (Markus and Kitayama 1991; Oishi and Diener 2001; Triandis 1995). Relatedly, as Belgium is a highly secularized country, research in more religious contexts or cultures is warranted as well, as religion can provide a tool for goal-setting and self-development for certain individuals and, hence, can guide identity development (King 2003; Markstrom 1999). However, research in highly religious contexts has indicated that, although foreclosed identity states may be quite prevalent in such contexts or cultures, engaging in active identity exploration seems to remain important for self-endorsed meaning-making and goal-setting (Negru-Subtirica et al. 2016), again underscoring the need for extended research on the identity—goal-striving link in diverse cultures and contexts.

Finally, in the present set of studies, identity processes and goal pursuits were assessed through self-report questionnaires only. Although questionnaires are most appropriate to gather information about internal processes such as identity and goal pursuits, the reliance on a single informant might artificially inflate correlations among constructs. Alternative informants (such as peers or parents) may be included in future research to gain a more differentiated perspective on, for instance, the goals emerging adults hope to obtain. Relatedly, in addition to the use of self-report questionnaires, interviews could be used to provide a more detailed perspective on emerging adults' identity development and goal pursuits from a narrative perspective.

Conclusion

The present longitudinal studies have generated important information on how key personal identity processes and goal strivings are related over time in college students. Whereas previous neo-Eriksonian research focusing on

personal identity formation in the challenging life phase of emerging adulthood focused mainly on commitment and exploration processes, the present studies applied an integrative perspective on identity processes and content strivings. For the commitment processes, we mainly found that striving for intrinsic (as opposed to extrinsic) goals played favorably into the strength of and experienced certainty with respect to identity commitments over time. For the exploration processes, reciprocal associations linking these identity processes to goal-content strivings were found, although the exact nature of these associations differed somewhat between Study 1 and Study 2. Combined, the present findings signal that, if we want to move the study of emerging adult identity formation forward, both identity processes and content (the goals one is striving for) need to be examined. Hence, we encourage researchers, taking the limitations of the present studies into account, to design further prospective studies to advance our knowledge of how identity processes and content are interrelated and possibly reinforce one another over time.

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Compliance with Ethical Standards

Conflict of Interest   The authors declare that they have no competing interests.

Ethical Approval   All studies were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent   Informed consent was obtained from all individual participants participating in the studies.

References

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, *55*, 469–480. doi:10.1037/0003-066X.55.5.469.

Assor, A. (2012). Allowing choice and nurturing an inner compass: Educational practices supporting students' need for autonomy. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 421–439). New York, NY: Springer. doi:10.1007/978-1-4614-2018-7_20

Baumeister, R. F. (1987). How the self became a problem: A psychological review of historical research. *Journal of Personality and Social Psychology*, *52*, 163–176. doi:10.1037/0022-3514.52.1.163.

Berzonsky, M. D. (1990). Self-construction across the life-span: A process view of identity development. In G. H. Neimeyer, &

R. A. Neimeyer (Eds.), *Advances in personal construct psychology* (pp. 155–186). Greenwich, CT: JAI. Vol. 1.

Berzonsky, M. D. (2011). A social-cognitive perspective on identity construction. In S. J. Schwartz, K. Luyckx, V. L. Vignoles (Eds.), *Handbook of identity theory and research* (pp. 55–76). New York, NY: Springer. doi:10.1007/978-1-4419-7988-9_3.

Berzonsky, M., Cieciuch, J., Duriez, B., & Soenens, B. (2011). The how and what of identity formation: Associations between identity styles and value orientations. *Personality and Individual Differences*, *50*, 295–299. doi:10.1016/j.paid.2010.10.007.

Bollen, K. A. (1989). *Structural equations with latent variables*. New York, NY: Wiley. doi:10.1002/9781118619179.

Buhl, H. M. (2007). Well-being and the child-parent relationship at the transition from university to work life. *Journal of Adolescent Research*, *22*, 550–571. doi:10.1177/0743558407305415.

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, *9*, 233–255. doi:10.1207/S15328007SEM0902_5.

Cole, D. A., & Maxwell, S. E. (2003). Testing meditational models with longitudinal data: Questions and tips in the use of structural equation modelling. *Journal of Abnormal Psychology*, *112*, 558–577. doi:10.1037/0021-843X.112.4.558.

Côté, J. E., & Bynner, J. M. (2008). Changes in the transition to adulthood in the UK and Canada: The role of structure and agency in emerging adulthood. *Journal of Youth Studies*, *11*, 251–268. doi:10.1080/13676260801946464.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*, 227–268. doi:10.1207/S15327965PLI1104_01.

Duriez, B., Luyckx, K., Soenens, B., & Berzonsky, M. (2012). A process-content approach to adolescent identity formation: Examining longitudinal associations between identity styles and goal pursuits. *Journal of Personality*, *80*, 135–161. doi:10.1111/j.1467-6494.2011.00729.x.

Duriez, B., Soenens, B., & Vansteenkiste, M. (2007). In search of the antecedents of adolescent authoritarianism: The relative contribution of parental goal promotion and parenting style dimensions. *European Journal of Personality*, *21*, 507–527. doi:10.1002/per.623.

Duriez, B., Vansteenkiste, M., Soenens, B., & De Witte, H. (2007). The social costs of extrinsic relative to intrinsic goal pursuits: Their relations with social dominance and racial and ethnic prejudice. *Journal of Personality*, *75*, 757–782. doi:10.1111/j.1467-6494.2007.00456.x.

Enders, C. K. (2010). *Applied missing data analysis*. New York, NY: Guilford.

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

Flum, H., & Blustein, D. L. (2000). Reinvigorating the study of vocational exploration: A framework for research. *Journal of Vocational Behavior*, *56*, 380–404. doi:10.1006/jvbe.2000.1721.

Galambos, N. L., & Martínez, M. L. (2007). Poised for emerging adulthood in Latin America: A pleasure for the privileged. *Child Development Perspectives*, *1*, 109–114. 10.1111/j.1750-8606.2007.00024.x.

Glorieux, I., Laurijssen, I. & Sobczyk, O. (2015). *Studiesucces in het eerste jaar hoger onderwijs* in Vlaanderen. Een analyse van de impact van kenmerken van studenten en van opleidingen. [Study success in first year higher education in Flanders. An analysis of the impact of student and education characteristics.] Research paper SSL/2014.15/4.1.2, Steunpunt SSL, Leuven.

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

Havermans, N., & Hooghe, M. (2011). *Kerkpraktijk in België: Resultaten van de zondagstelling in oktober 2009*. [Church

practice in Belgium: Results of the sunday count in October 2009]. KU Leuven, Leuven: Centrum voor Politicologie.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55. doi:10.1080/10705519909540118.

Kasser, T. (2002). *The high price of materialism*. London: MIT.

Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin*, 22, 280–287. doi:10.1177/0146167296223006.

King, P. E. (2003). Religion and identity: The role of ideological, social, and spiritual contexts. *Applied Developmental Science*, 7, 197–204. doi:10.1207/S1532480XADS0703_11.

Klimstra, T. A., Luyckx, K., & Meeus, W. H. J. (2013). Personal identity in Belgium and the Netherlands. In S. J. Schwartz (Ed.), *Identity around the world. New directions for child and adolescent development*. John Wiley & Sons, 138, 19–34.

Kline, R. B. (2005). *Principles and practices of structural equation modeling*. 2nd edn. New York, NY: Guilford.

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. 31–54). New York, NY: Springer. doi:10.1007/978-1-4419-7988-9_2.

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., 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. doi:10.1037/0012-1649.42.2.366.

Luyckx, K., Klimstra, T. A., 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. doi:10.1111/sode.12027.

Luyckx, K., Klimstra, T. A., Duriez, B., Van Petegem, S., Beyers, W., Teppers, E., & Goossens, L. (2013). Personal identity processes and self-esteem: Temporal sequences in high school and college students. *Journal of Research in Personality*, 47, 159–170. doi:10.1016/j.jrp.2012.10.005.

Luyckx, K., Lens, W., Smits, I., & Goossens, L. (2010). Time perspective and identity formation: Short-term longitudinal dynamics in college students. *International Journal of Behavioral Development*, 34, 238–247. doi:10.1177/0165025409350957.

Luyckx, K., Schwartz, S. J., Berzonsky, M. D., 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. doi:10.1016/j.jrp.2007.04.004.

Luyckx, K., Schwartz, S. J., Goossens, L., & Pollock, S. (2008). Employment, sense of coherence, and identity formation: Contextual and psychological processes on the pathway to sense of adulthood. *Journal of Adolescent Research*, 23, 566–591. doi:10.1177/0743558408322146.

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.

Luyckx, K., Vansteenkiste, M., Goossens, L., & Duriez, B. (2009). Basic need satisfaction and identity formation: Bridging self-determination theory and process-oriented identity research.

Journal of Counseling Psychology, 56, 276–288. doi:10.1037/a0015349.

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

Marcia, J. E. (1980). Identity in adolescence. In J. Adelson (ed). *Handbook of adolescent psychology* (pp. 159–186). New York, NY: Wiley.

Markstrom, C. A. (1999). Religious involvement and adolescent psychosocial development. *Journal of Adolescence*, 22, 205–221. doi:10.1006/jado.1999.0211.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224–253. doi:10.1037/0033-295X.98.2.224.

Montgomery, M. J., & Côté, J. E. (2003). College as a transition to adulthood. In G. R. Adams, & M. D. Berzonsky (Eds.), *Blackwell handbook of adolescence* (pp. 149–172). Malden, MA: Blackwell.

Muthén, L. K., & Muthén, B. O. (2002). *Mplus user's guide*. Los Angeles, CA: Muthén & Muthén.

Negru-Subtirica, O., Tiganasu, A., Dezutter, J., & Luyckx, K. (2016). A cultural take on the links between religiosity, identity, and meaning in life in religious emerging adults. *British Journal of Developmental Psychology*.

Niemiec, C. P., Ryan, R. M., & Deci, E. L. (2009). The path taken: Consequences of attaining intrinsic and extrinsic aspirations in post-college life. *Journal of Research in Personality*, 43, 291–306. doi:10.1016/j.jrp.2008.09.001.

Oishi, S., & Diener, E. (2001). Goals, culture, and subjective well-being. *Personality and Social Psychology Bulletin*, 27, 1674–1682. doi:10.1177/01461672012712010.

Orth, U., Robins, R. W., & Roberts, B. W. (2008). Low self-esteem prospectively predicts depression in adolescence and young adulthood. *Journal of Personality and Social Psychology*, 95, 695–708. doi:10.1037/0022-3514.95.3.695.

Reichardt, C. S. (2002). The priority of just-identified, recursive models. *Psychological Methods*, 7, 307–315. doi:10.1037/1082-989X.7.3.307.

Ryan, R. M., & Deci, E. L. (2002). On assimilating identities to the self: A self-determination theory perspective on internalization and integrity within cultures. In M. R. Leary, & J. P. Tangney (Eds.), *Handbook of self and identity* (pp. 253–275). New York, NY: Guilford.

Schachter, E. P., & Ventura, J. J. (2008). Identity agents: Parents as active and reflective participants in their children's identity formation. *Journal of Research on Adolescence*, 18, 449–476. doi:10.1111/j.1532-7795.2008.00567.x.

Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods*, 7, 147–177. doi:10.1037/1082-989X.7.2.147.

Schmuck, P., Kasser, T., & Ryan, R. M. (2000). Intrinsic and extrinsic goals: Their structure and relationship to well-being in German and U.S. college students. *Social Indicators Research*, 50, 225–241. doi:10.1023/A:1007084005278.

Schwartz, S. J., Côté, J. E., & Arnett, J. J. (2005). Identity and agency in emerging adulthood: Two developmental routes in the individualization process. *Youth and Society*, 37, 201–229. doi:10.1177/0044118×05275965.

Schwartz, S. J., Donnellan, M. B., Ravert, R. D., Luyckx, K., & Zamboanga, B. L. (2013). Identity development, personality, and well-being in adolescence and emerging adulthood: Theory, research, and recent advances. In I. B. Weiner (Series Ed.), and R. M. Lerner, A. Easterbrooks, & J. Mistry (Eds.), *Handbook of psychology, Vol. 6: Developmental psychology* (pp. 339–364). New York, NY: Wiley.

Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *Journal of Personality and Social Psychology, 76*, 482–497. doi:10.1037/0022-3514.76.3.482.

Soenens, B., & Vansteenkiste, M. (2011). When is identity congruent with the self? A self-determination theory perspective. In S. J. Schwartz, K. Luyckx, & V. L. Vignoles (Eds.), *Handbook of identity theory and research* (pp. 381–402). New York, NY: Springer. doi:10.1007/978-1-4419-7988-9_17.

Soenens, B., Wuyts, D., Vansteenkiste, M., Mageau, G. A., & Brenning, K. (2015). Raising trophy kids: The role of mothers' contingent self-esteem in maternal promotion of extrinsic goals. *Journal of Adolescence, 42*, 40–49. doi:10.1016/j.adolescence.2015.04.001.

Swann, Jr., W. B., Chang-Schneider, C., & McClarty, K. L. (2007). Do people's self-views matter? Self-concept and self-esteem in everyday life. *American Psychologist, 62*, 84–94. doi:10.1037/0003-066X.62.2.84.

Thomsen, D. K., Tonnesvang, J., Schnieber, A., & Olesen, M. H. (2011). Do people ruminate because they haven't digested their goals? The relations of rumination and reflection to goal internalization and ambivalence. *Motivation and Emotion, 35*, 105–117. doi:10.1007/s11031-011-9209-x.

Triandis, H. C. (1995). *Individualism and collectivism*. Boulder, CO: Westview.

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3*, 4–70. doi:10.1177/109442810031002.

Vansteenkiste, M., & Soenens, B. (2015). *Vitamines voor groei: Ontwikkeling voeden vanuit zelf-determinatie theorie [Vitamins for growth: Nurturing development from self-determination theory]*. Leuven: Acco.

Yoder, A. E. (2000). Barriers to ego identity status formation: A contextual clarification of Marcia's identity status paradigm. *Journal of Adolescence, 23*, 95–106. doi:10.1006/jado.1999.0298.

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