The Very Best of Me:

Longitudinal Associations of Perfectionism and Identity Processes in Adolescence

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Abstract

Personality and identity formation are intricately linked in adolescent development. The personality disposition of perfectionism has been associated with identity processes, but their longitudinal interplay in adolescence has not yet been investigated. This 4-wave study, with 5- to 6-month intervals between each wave (N = 744 Caucasian adolescents, M_{age} = 15.2 years, 55% girls), examined associations between perfectionism (self-oriented and socially prescribed) and identity processes in the domain of future plans. Self-oriented perfectionism predicted increases in commitment making, identification with commitment, and exploration in depth. Socially prescribed perfectionism showed bidirectional positive relations with ruminative exploration. Exploration in depth predicted increases in socially prescribed perfectionism. Findings suggest that perfectionism is an important personality disposition in adolescent identity formation unfolding over time.

Keywords: adolescence; perfectionism; identity formation; longitudinal analyses; latent difference score analyses

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Goals and choices for the future stand as cornerstones for agentic personal and social development in adolescence (Crone & Dahl, 2012). In many industrialized societies, social and cultural requirements emphasize the importance of competitiveness and individualism, often hinting at a desired link between aiming for becoming "the very best in everything I do" in the quest of discovering who you are. Accordingly, a recent meta-analysis found an increase in perfectionism in youth in the last decades (Curran & Hill, 2019). Hence, especially in key developmental timeframes like adolescence, identity formation may be related to perfectionism, as many young people may strive to become the absolute best at whatever they are striving for. Nevertheless, to date no study has approached this relation from a longitudinal perspective. In this four-wave study (with five- to six-month intervals between each wave), we set out to investigate how identity processes and perfectionism are longitudinally linked in adolescence, by employing a latent difference score approach (McArdle, 2009).

Identity Formation Processes in Adolescence

Identity formation is a core developmental task for adolescents, as their capacities to plan for and project themselves into the future become more complex and self-salient (Crone & Fuligni, 2020). Personal identity reflects the goals, plans, and values that are central for the self-system, and identity formation can be considered a quest to find answers to the question "Who am I?" (Marcia, 1966; Schwartz, Zamboanga, Wang, & Olthuis, 2009).

Contemporary approaches to personal identity (Crocetti, Rubini, & Meeus, 2008; Luyckx, Goossens, Soenens, Beyers, & Vansteenkiste, 2006) investigate the interplay between identity exploration and commitment through process-focused lenses, bringing forward the dynamic of identity development. One such approach is the five-dimensional

model developed by Luyckx and colleagues (Luyckx et al., 2006; Luyckx, Schwartz, et al., 2008) which focuses on the domain of future plans. This model integrates five separate but interrelated processes of identity formation, organized in two cycles of identity growth: the identity formation cycle and the identity evaluation cycle. The identity formation cycle comprises exploration in breadth (active exploration of multiple paths for future development) and commitment making (choice of certain goals and plans). The identity evaluation cycle focuses on exploration in depth (careful evaluation of existing commitments) and on identification with commitment (integration or internalization of existing commitments into one's core self-structure). Exploration in breadth and exploration in depth are viewed as proactive pursuits, as they mobilize the person toward commitment formation or evaluation. The fifth process, ruminative exploration, is regarded a maladaptive form of exploration that inhibits and delays identity growth through excessive worry and feelings of uncertainty regarding the appropriateness of personal commitments for the future.

Identity commitment processes are characterized by trust and confidence in the plans adolescents make and the goals they set for the future. Accordingly, longitudinal studies with adolescents found positive links between commitment and the Big Five personality traits of conscientiousness, extraversion, and openness (e.g., Klimstra et al., 2013). Whereas changes in extraversion and openness were positively linked to changes in identification with commitment, changes in conscientiousness across time were positively associated with changes in both commitment making and identification with commitment (Hatano, Sugimura, & Klimstra, 2017). Additionally, adolescents' firm goals, values, and beliefs regarding the future (representing high commitment levels) predicted—and were in turn longitudinally predicted by—a clear sense of meaning in life (i.e., the presence of meaning;

Negru-Subtirica, Pop, Dezutter, Luyckx, & Steger, 2016).

Exploration in breadth and exploration in depth both drive the identity formation and identity evaluation cycles through complex mechanisms of multiple goal surveying followed by a thorough goal analysis. These processes require extensive personal resources and are linked to positive and negative indicators of psychosocial functioning. Longitudinally, exploration in breadth positively predicted adolescents' search for meaning in their lives (Negru-Subtirica et al., 2016). Relative increases in both forms of explorations were longitudinally predicted by openness to experience (Luyckx, Teppers, Klimstra, & Rassart, 2014). Exploration of future goals was positively linked to conscientiousness, extraversion, and openness to experience (Klimstra et al., 2013), indicating that adolescents who investigate what their future may hold tend to be more goal-directed and outgoing. Additionally, exploration in depth of existing commitments was found to strengthen across time by means of self-reflection and active evaluation of self-relevant information (Negru-Subtirica, Pop, & Crocetti, 2017). However, by engaging in proactive exploratory pursuits, adolescents may also become more distressed, as indicated by studies that found links of exploration in depth with anxiety and depressive symptoms (Crocetti et al., 2008) as well as conduct problems (Hatano, Sugimura, & Luyckx, 2020).

In contrast to the other identity processes in Luyckx et al.'s (2006) model, ruminative exploration is generally viewed as a maladaptive process, that is, a dysfunctional form of identity exploration marked by excessive worry and rumination over goals and plans for the future (Luyckx, Schwartz, et al., 2008). Longitudinal studies have shown that individual differences in depressive symptoms predicted between-person increases in ruminative exploration (Hatano et al., 2020), and that ruminative exploration predicted within-person increases in depressive symptoms as well as conduct problems (Becht et al., 2019; Hatano et

al., 2020). Furthermore, in another longitudinal study, Luyckx et al. (2014) found extraversion to be a negative predictor and openness a positive predictor of ruminative exploration as well as bidirectional negative relations between ruminative exploration and conscientiousness. Taken together, these findings indicate that increased ruminative exploration is an identity process that hampers adolescents' planning for the future and goal-orientation and their emotional lives. Moreover, adolescents showing elevated levels of ruminative exploration tend to have lower assertiveness and—even though they seem to be somewhat more open-minded than adolescents showing lower levels of ruminative exploration—seem to lack a clear direction for their future.

Perfectionism in Adolescence

Perfectionism is a prevalent personality disposition characterized by exceedingly high standards that are difficult, if not impossible to meet (Stoeber, 2018). Moreover, perfectionism is a multidimensional personality disposition that comes in different forms comprising various aspects (Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991). One of the most influential and widely researched models of dispositional perfectionism is Hewitt and Flett's (1991). Examining personal and social aspects of perfectionism, Hewitt and Flett identified two main forms of perfectionism in adolescence: self-oriented perfectionism and socially prescribed perfectionism (Flett et al., 2016). The two forms differ in how perfectionism is motivated. Self-oriented perfectionism is mainly internally motivated. People reporting elevated levels of self-oriented perfectionism have exceedingly high personal standards. They strive for perfection and expect to be perfect. In contrast, socially prescribed perfectionism is mainly externally motivated. People reporting elevated levels of socially prescribed perfectionism

think that significant others (e.g., parents, friends) hold them to exceedingly high

standards and expect them to be perfect, and that these significant others will disapprove of them if they are not. The two forms of perfectionism have markedly different psychological profiles. Whereas both forms reflect a need to be perfect, self-oriented perfectionism is construed around exceedingly high personal standards which in achievement-oriented societies may have positive effects (e.g., higher performance), but may also have negative consequences (e.g., higher levels of stress; Curran & Hill, 2019). As a consequence, self-oriented perfectionism can be regarded as a maladaptive form of perfectionism that sometimes shows positive relations with psychological characteristics, processes, and outcomes that are considered adaptive such as conscientiousness, achievement motivation, and positive affect (Stoeber, Feast, & Hayward, 2009). In contrast, socially prescribed perfectionism is a thoroughly maladaptive form of perfectionism associated only with dysfunctional characteristics, processes, and outcomes reflecting adjustment problems and psychological distress (Hewitt & Flett, 1991; Stoeber, 2018; Stoeber et al., 2009). The two forms of perfectionism may display different profiles of associations, but they may also show similarities in their associations with indicators of positive and negative functioning (Stoeber, Edbrooke-Childs, & Damian, 2018).

Even though there are gaps in the research literature regarding stability and change in the development of perfectionism, extant theory and research suggests that perfectionism is a disposition that usually develops in childhood and then solidifies and becomes more pronounced in adolescence (Stoeber et al., 2018). Consequently, adolescence appears to be a key timeframe for the development of perfectionism, with social evaluation and social comparison becoming more central to self-formation (Crone & Fuligni, 2020). Adolescents actively process and integrate the perspectives of others and search more systematically for external validation of their actions from significant others. Additionally, perfectionism can be seen as a consequence of a culture of high competitiveness and absolute responsibility of the self for the future (Hewitt,

Flett, & Mikail, 2017). Some cultural norms of industrialized societies (e.g., competitiveness, meritocracy beliefs) have adolescents focus more and more on setting and pursuing exceedingly difficult goals, often turning the self into an instrument for social validation. These exceedingly difficult goals seem many times self-set. Moreover, this may just indicate that adolescents already interiorized cultural norms from industrialized societies, hence experiencing strong internal pressure to pursue them (Curran & Hill, 2019). Hence, self-set performance expectations are also marked by social evaluation processes.

The differences and similarities in the psychological profiles of self-oriented and socially prescribed perfectionism are also evident in research with adolescents. On the one hand, self-oriented perfectionism has been longitudinally linked to academic achievement, with high academic achievement predicting relative increases in self-oriented perfectionism and vice versa (Damian, Stoeber, Negru-Subtirica, & Băban, 2017a). Cross-sectional evidence indicated that self-oriented perfectionism is positively related to mastery approach goals, performance approach goals, and academic self-efficacy, and negatively to academic procrastination (Bong, Hwang, Noh, & Kim, 2014; Damian, Stoeber, Negru, & Băban, 2014a). Additionally, it was longitudinally predicted by high conscientiousness (Stoeber, Otto, & Dalbert, 2009) which may indicate that adolescents who elaborate plans and are goal-directed also tend to develop high expectations regarding their performance. Further, self-oriented perfectionism was linked with more positive affect (Damian, Stoeber, Negru, & Băban, 2014b) and it was longitudinally connected to increases in adaptive emotion regulation strategies (reappraisal) and decreases in maladaptive strategies (non-acceptance of emotional responses; Vois & Damian, 2020). On the other hand, cross-sectional studies positively linked self-oriented perfectionism with depression, anxiety, disordered eating, and reduced interpersonal functioning (e.g., Hewitt et al., 2002; Magson, Oar, Fardouly, Johnco, & Rapee, 2019). And these relations tended to be more

pronounced when participants experienced significant life stressors (e.g., educational, interpersonal), which indicates that self-oriented perfectionism may be maladaptive in difficult and novel situations.

In comparison, socially prescribed perfectionism in adolescence is consistently maladaptive. Cross-sectional studies found positive relations with anxiety, depression, and disordered eating (Hewitt et al., 2002), and reduced interpersonal functioning (rejection sensitivity and social isolation) may be a mediator of these relations (Magson et al., 2019). In educational contexts, socially prescribed perfectionism was positively related to test anxiety and academic procrastination, performance approach and performance avoidance goals, and perceived academic inferiority (Bong et al., 2014; Damian et al., 2014a; Lee, Ha, & Jue, 2020). From a longitudinal perspective, socially prescribed perfectionism was predictive of anxiety, difficulties in emotion regulation, and bullying involvement (Damian, Negru-Subtirica, Stoeber, & Băban, 2017; Farrell & Vaillancourt, 2019; Vois & Damian, 2020). The negative impact of this form of perfectionism was attributed to the social disconnection and increased stress generated by the excessive goals and performance expectations believed to be set by significant others, as indicated in a recent meta-analysis (Smith, Sherry, Vidovic, Hewitt, & Flett, 2020). Another meta-analysis (Xie, Kong, Yang, & Chen, 2019) underscored a strong positive relation between socially prescribed perfectionism and worry and rumination, and also indicated that worry and rumination are mediators in the relation between socially prescribed perfectionism and distress.

Unfortunately, the majority of studies comprised in the meta-analyses involved university students or adult samples. Also, most studies with adolescents employed cross-sectional designs, and the few available longitudinal studies on perfectionism did not investigate the relations between perfectionism and core self-structures like identity. Such studies, however, would be

important considering the central role that identity formation plays in adolescent development.

Perfectionism and Identity Formation in Adolescence

Personality is intricately linked to identity formation in adolescence, and vice versa, as the values adolescents have, the plans they make, and the goals they strive for and integrate into their core self-structure can be supported—or thwarted—by individual differences in personality through complex mechanisms of self-regulation (Denissen, van Aken, Penke, & Wood, 2013). Perfectionism has been long linked to personal identity in the psychotherapy literature, and recent theoretical approaches have brought forward the key role of identity in understanding the development of perfectionism, with perfectionism being conceptualized as a reflection of a person's identity (Hewitt et al., 2017). Hewitt et al. point out that socially prescribed perfectionists exhibit significant psychopathology in terms of identity diffusion and relatively diffuse identity boundaries (see p. 125). They also emphasize the notion that the competence and achievements of the self-oriented perfectionist can become an entrenched part of identity, but this identity component may pose a problem if achievement failures are subsequently experienced (see p. 121). The connections between personality and identity formation, however, have mainly been investigated regarding broad personality traits like the Big Five (e.g., Reese et al., 2017) whereas less attention has been paid to specific personality dispositions that may also play an important role. Perfectionism may be such a personality disposition, particularly as it appears to be strongly and increasingly related to identity in current generations of young people (Curran & Hill, 2019). This perfectionism–identity link has been related to the rise of the neo-liberal doctrine, competitive individualism, and meritocracy beliefs which have changed, and now are integrated in the culture of many industrialized countries. As a consequence, Curran and Hill suggest, young people may nowadays experience a culture where personal achievement is a core component of their self-worth.

The idea that perfectionism is increasingly linked to identity formation is also worthwhile and important from a developmental perspective focused on adolescent health and well-being. The reason is that perfectionism revolves around unresolved identity issues, which sabotage personal achievements, depriving them of a sense of success and satisfaction (Hewitt et al., 2017). This link is even more relevant in adolescence, which is a developmental period marked by extensive identity formation (Meeus, 2016). Hence, shedding light into the longitudinal relations between perfectionism and identity formation may help understand how unrealistic goals and excessive expectations either set by the self (self-oriented perfectionism) or believed to be set by significant others (socially prescribed perfectionism) are integrated into processes of identity exploration and commitment unfolding over time.

The few studies that to date have tapped into the relations between perfectionism and identity all employed cross-sectional designs and mainly focused on university students (e.g., Luyckx, Soenens, Goossens, Beckx, & Wouters, 2008). A recent two-wave study with a sample of university students found that socially prescribed perfectionism positively predicted identity diffusion (Chen, Hewitt, Flett, & Roxborough, 2019). To our knowledge, there has been no longitudinal study investigating these relations in adolescence. Consequently, we must mainly draw on cross-sectional evidence for suggestions of what longitudinal relations between perfectionism and identity processes to expect. In one study with adolescents (Luyckx, Soenens, et al., 2008), perfectionistic personal standards—an aspect of perfectionism closely related to self-oriented perfectionism—were positively related to all adaptive exploration and commitment processes of Luyckx et al.'s model (commitment making, identification with commitment, exploration in breath, exploration in depth), and negatively related to ruminative exploration. In the same study, perfectionistic concern over mistakes—an aspect of perfectionism closely related to socially prescribed perfectionism—was positively linked to ruminative exploration, and

negatively linked to commitment processes (commitment making, identification with commitment). Another study with university students (Piotrowski, 2019) replicated these findings, suggesting that perfectionism may both support and thwart identify formation, and that different forms and aspects of perfectionism play different roles in the prediction of adaptive versus maladaptive processes underlying identity formation. To examine how the relations between perfectionism and identity processes unfold over time as adolescents develop, and also explore if there are reciprocal relations of identity processes feeding back on adolescents' perfectionism, longitudinal studies are needed.

The Present Study

This four-wave longitudinal study investigated the longitudinal relations between two forms of perfectionism (self-oriented and socially prescribed perfectionism) and five identity formation processes in the domain of future plans (commitment making, identification with commitment, exploration in depth, exploration in breadth, ruminative exploration). Because this is, as far as we know, the first study to examining these relations with adolescents, using a longitudinal design, the study was largely exploratory. Still, from the previous cross-sectional studies with adolescents and university students (Luyckx, Soenens, et al., 2008; Piotrowski, 2019) we expected that self-oriented perfectionism, being closely related to perfectionistic personal standards, would predict increases in adaptive identity processes (commitment making, identification with commitment, exploration in breadth, exploration in depth). In contrast, we expected socially prescribed perfectionism, being closely related to perfectionistic concern over mistakes, to predict increases in the maladaptive identity process of ruminative exploration. Socially prescribed perfectionism has been linked to depressive symptoms including rumination in adolescents (e.g., Xie et al., 2019) and to identity diffusion in university students (Chen et al., 2019).

Method

Participants and Procedure

Data for the present study were drawn from the four-wave longitudinal project PERSEIDA (Perfectionism in Self and Identity Development in Adolescence; Damian, Negru-Subtirica, Pop, & Stoeber, accepted). The sample consisted of 744 adolescents at Time 1 (M_{age} = 15.2 years, *SD* = 1.9, range = 11-19 years; 55% girls), 744 at Time 2 (M_{age} = 15.6, *SD* = 1.9, range 11-20 years; 54% girls), 637 at Time 3 (M_{age} = 15.9, *SD* = 1.8, range 12-20 years; 54% girls), and 637 at Time 4 (M_{age} = 16.4, *SD* = 1.8, range 12-20 years; 54% girls). All adolescents were Caucasian and of Romanian ethnicity; participants were students in three schools from North-Western Romania. In terms of family characteristics, the parents of 83% of the adolescents were married, and the remaining 17% of adolescents had a range of different family situations pertaining to parental divorce (8%), parental remarriage (4%), parental loss (3%), and other (2%). Most of the adolescents lived with one or both biological parents (93%) and had at least one sibling (74%). Most were fully financially supported by their parents (86%), but 12% had some personal income (e.g., state-provided student allocation, scholarship) and 2% were financially supported by relatives.

The PERSEIDA project was approved by the ethical committee of the first author's university. A written collaboration protocol was signed with three participating schools (all of which were public high schools from the North-West part of Romania) to get access to participants. Adolescents and parents were informed about the research through a written letter distributed directly to the adolescents. Both adolescent and parental consent were obtained. Participation in the study was voluntary and confidential with no financial compensation for the participants, and parents could withdraw their child from the study at any time. Participating adolescents were involved in a four-wave longitudinal study with five- to six-month intervals

between each wave throughout the span of two academic years (December 2014 to May 2016). This time interval was chosen to investigate change between each semester of the two academic years. At each measurement point, adolescents completed the same questionnaires and did this in their classrooms during school hours. No exclusion criteria were applied.

Missing Data Analysis

Of the total sample, 86% of adolescents participated in three and four waves of the study (n = 637) and 14% of adolescents participated in two waves. Participants who dropped out from the study did not differ from those who completed all four waves in terms of gender (χ^2[1, 740] = 1.52, p = .218), parental marital status (χ^2[5, 636] = 2.65, p = .755), living conditions (χ^2[4, 636] = 3.44, p = .488), number of siblings (χ^2[10, 613] = 13.72, p = .168), or financial support (χ^2[3, 624] = 0.53, p = .913). Missing data analyses showed that overall, 24% of data were missing from Time 1 to Time 4. The range of missing data varied from 14% (Time 1) to 35% (Time 4). We used Little's (1988) Missing Completely at Random (MCAR) test to examine the missing data. Results showed a normed χ^2/df of 1.10 suggesting that the data were missing at random (Bollen, 1989). Thus, all participants (N = 744) were included in our analyses and missing data were estimated using the full information maximum likelihood (FIML) procedure in M*plus* 8.4 (Muthén & Muthén, 1998-2017).

Measures

Perfectionism

To measure perfectionism, we used the Child-Adolescent Perfectionism Scale (CAPS; Flett et al., 2016; Romanian version: Damian, Stoeber, et al. 2017a, b). The CAPS comprises 22 items capturing self-oriented perfectionism (12 items; e.g., "I try to be perfect in everything I do") and socially prescribed perfectionism (10 items; "Other people think that I have failed if I do not do my very best all the time"). Participants responded to all items on a scale from 1 (*not at all*) to 5

(*very much*). Cronbach's alphas for the two scales ranged from .77 to .84 across the four waves (see Table 1).

Identity Processes

Identity processes were measured with the Dimensions of Identity Development Scale (DIDS; Luyckx, Schwartz, et al., 2008; Romanian version: Negru-Subtirica et al., 2016). The DIDS comprises 25 items with 5 items each capturing commitment making (e.g., "I have decided on the direction I want to follow in my life"), identification with commitment ("I sense that the direction I want to take in my life will really suits me"), exploration in breadth ("I regularly think over a number of different plans for the future"), exploration in depth ("I regularly talk with other people about the plans for the future I have made for myself"), and ruminative exploration ("It is hard for me to stop thinking about the direction I want to follow in my life"). As with the CAPS, participants responded to all items on a scale from 1 (*not at all*) to 5 (*very much*). Cronbach's alphas for the five scales ranged from .82 to .92 (see again Table 1).

Analytic Strategy

Whereas we computed descriptive statistics and within-time correlations in SPSS 21, all other analyses were performed in M*plus* 8.4 using the Maximum Likelihood Robust estimator (MLR; Satorra & Bentler, 1994). First, a confirmatory factor analysis was conducted for each of the measures. Second, we tested whether the two measures showed configural, metric, and scalar longitudinal invariance, as measurement invariance is a prerequisite for conducting latent difference score (LDS) analyses (Newsom, 2015). Thus, we tested three different models to assess configural, metric, and scalar invariance. Configural invariance determines whether the same factors and patterns of factor loadings exist over time. Metric invariance establishes whether the magnitude of the factor loadings is equal over time. Scalar invariance establishes whether differences on the items are only due to differences on the common factors (Little,

2013).

Third, we used Latent Difference Score (LDS) analysis to explore reciprocal effects linked to time-dependent change (McArdle, 2009; McArdle & Hamagami, 2001). The LDS framework models a latent difference variable that captures increases or declines in the true score for each variable between two adjoining time-points (e.g., Δ commitment making at Time 2, Δ commitment making at Time 3, Δ commitment making at Time 4 with Δ indicating "difference in"). The latent difference variable (e.g., Δ commitment making Time 2) is composed of the latent true score of a participant at the prior time-point (e.g., commitment making at Time 1) and the true latent change from Time 1 to Time 2. Hence, the LDS framework captures time-dependent change, compared to a Cross-Lagged Panel Model (CLPM) that captures time-dependent states (Grimm, Ram, & Estabrook, 2016). Consequently, a longitudinal LDS model can be seen as a re-parametrization of a CLPM by specifying the latent change components in the variables over time (Newsom, 2015). Put differently, LDS models allow the examination of "cross-lagged dynamic coupling of key factors over time" (McArdle, 2009, p. 597). In our study, we employed a change regression model (McArdle, 2009) capturing how the latent variables' level scores at a previous time point (e.g., Time 1) predict within-person change in those variables at the successive time point (e.g., change from Time 1 to Time 2).

We employed multiple indices to appraise the fit of our models (Little, 2013): the Comparative Fit Index (CFI) with values > .90 indicating an acceptable fit and values >.95 an excellent fit; and the Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) with values < .08 indicating an acceptable fit and values < .05 a good fit. To determine significant differences between nested models, we followed recommendations that at least two out of the following three criteria should be met: $\Delta\chi_{SB}^2$ significant at $p < .05$, $\Delta CFI \geq -.010$, or $\Delta RMSEA \geq .015$ (Chen, 2007; Cheung & Rensvold,

2002).

Results

Preliminary Analyses

The means, standard deviations, and correlations of the variables across waves are presented in Table 1. We can interpret these correlations using Cohen's (1988) benchmarks for effect size magnitude where correlation coefficients around the value of .10 are viewed as "small," those around .30 as "medium," and those of .50 and above as "large" (Hemphill, 2003).

Confirmatory factor analyses (CFAs) indicated factorial validity for both measures. For the CAPS, we conducted the CFA with the parceling procedure (Little, 2013) and obtained an excellent fit of the two-factor model (Damian et al., 2013; Flett et al., 2016) to the data: $\chi^2(8) = 33.76$, CFI = .979, RMSEA = .071, SRMR = .035. For the DIDS, in line with previous studies (e.g., Luyckx, Schwartz. et al., 2008; Negru-Subtirica et al., 2016), findings indicated an acceptable fit of the five-factor model (with two error covariances between similarly worded items loading on the same latent factor included) to the data: $\chi^2(263) = 920.88$, CFI = .909, RMSEA = .063, SRMR = .088. Additional information on these procedures is presented in the Supplemental Material. Furthermore, the analysis of measurement invariance indicated that for both measures all levels of longitudinal invariance were established (see Table 2).

Main Analyses

As regards our main analyses—the LDS analyses of the longitudinal relations between perfectionism and identity processes across the four waves—we started by examining whether perfectionism at Time 1 (e.g., self-oriented perfectionism) predicted within-person changes in identity processes from Time 1 to Time 2, and whether identity processes at Time 1 (e.g., commitment making at Time 1) predicted within-person changes in perfectionism from Time 1 to Time 2. As our sample was gender-balanced (55% girls), participants' gender (0 = boys; 1 =

girls) was introduced as a covariate in all the tested models, to investigate the effect of gender. First, we tested an LDS model (Model 1) that was a respecified CLPM with no constraints (Newsom, 2015). In this, we included latent difference score variables to investigate change in perfectionism and identity processes between Time 1 and Time 2, Time 2 and Time 3, and Time 3 and Time 4. We created latent difference factors by (a) setting the means and disturbances of the Time 2, Time 3, and Time 4 latent variables from the CLPM to 0; (b) setting all autoregressive (stability) paths between latent variables from the CLPM to 1; (c) defining a new latent difference score variable for each Time 2, Time 3, and Time 4 variable in the CLPM that was expressed by a single loading on the latent variable from the CLPM that was fixed to 1; and (d) regressing the latent difference score variable on all latent variables from the CLPM model appraised in prior time point(s). A simplified example (including only two variables) of the fixed and estimated paths for the variables in this baseline model is shown in Figure 1 (Model 1).

Second, we computed a more parsimonious LDS model by constraining all cross-lagged paths linking level scores and latent change variables from Model 1 to be time invariant (see Figure 1, Model 2, for the same simplified example) to examine whether the paths were similar between time points. When we tested these models for our data, model comparison indices (Model 1 versus Model 2) indicated that the two models had a similar model fit (see Table 3). Hence, we maintained these constraints and retained the Model 2 as the final LDS model.

Figure 2 presents the standardized results of Model 2 for the variables of our study excluding exploration in breadth because no paths leading to or from this identity process were significant, and so it was omitted from the figure. The estimated longitudinal associations between the two forms of perfectionism and among the five identity processes are presented in the Supplemental Material (Table S4). In line with expectations, results indicated that self-oriented perfectionism at Time 1, Time 2, and Time 3 predicted increases in both commitment

processes (commitment making, identification with commitment) as well as exploration in depth from Time 1 to Time 2, Time 2 to Time 3, and Time 3 to Time 4. Moreover, these relations were unidirectional running from self-oriented perfectionism to the three identity processes as there were no reciprocal effects: None of the identity processes predicted changes in self-oriented perfectionism. In contrast, socially prescribed perfectionism at Time 1, Time 2, and Time 3 predicted increases in ruminative exploration from Time 1 to Time 2, Time 2 to Time 3, and Time 3 to Time 4. Moreover, this relation was bidirectional because ruminative exploration also predicted increases in socially prescribed perfectionism between the time points. Also—and this was not expected—exploration in depth at Time 1, Time 2, and Time 3 predicted increases in socially prescribed perfectionism from Time 1 to Time 2, Time 2 to Time 3, and Time 3 to Time 4. The magnitude of the standardized coefficients presented in Figure 2 needs to be interpreted considering that longitudinal models with autoregressive components control for stability effects when predicting change, which eliminates a significant amount of the variance in the outcome variables (Adachi & Willoughby, 2015). Last, across all four waves, participants' gender was longitudinally linked only to changes in exploration in breadth, with girls reporting higher levels of change in this identity process, compared to boys (see Supplemental Material, Table S5).

Discussion

Perfectionism revolves around personal identity issues and it is embedded in the way people plan for the future, setting exceedingly difficult goals and expecting to perform without making any mistakes (Hewitt et al., 2017). Identity and perfectionism are increasingly related in young generations, as cultural changes in many industrialized countries link personal achievement to being flawless, unwavering, and competitive (Curran & Hill, 2019). Hence, adolescents may engage in over-analyzing and over-exploring the "very best" path(s) for their future, as they themselves and their significant others may have already set very high and often

unattainable goals. This four-wave longitudinal study explored these potential relations, depicting complex longitudinal associations between two forms of perfectionism (self-oriented perfectionism, socially prescribed perfectionism) and identity processes in the domain of future plans: commitment making, identification with commitment, exploration in breadth, exploration in depth, and ruminative exploration. Self-oriented perfectionism was linked to positive changes in identity commitments. Also, we found a bidirectional positive relation between socially prescribed perfectionism and ruminative exploration. Finally, self-oriented perfectionism was linked to positive changes in exploration in depth while exploration in depth was linked with positive changes in socially prescribed perfectionism.

Self-Oriented Perfectionism Predicts Commitment-Related Identity Processes

How can these findings help understand the interplay of perfectionism and identity formation in adolescent development? Our study found that self-oriented perfectionism longitudinally supports and strengthens identity commitments. Exceedingly high self-set goals and standards for performance tended to contribute, across time, to within-person increases in identity commitment processes in the domain of future plans (i.e., commitment making, identification with commitment). These results indicate that the higher adolescents aim while striving for perfection, the more they devote themselves to a path (e.g., goal, plan) for their future.

Identity commitment processes (Hatano et al., 2017; Klimstra et al., 2013) and self-oriented perfectionism (e.g., Stoeber et al., 2009) have been longitudinally linked to conscientiousness, indicating that goal-directedness and planfulness are important for committing to goals for the future and also for setting exceedingly high goals for the self. This common link with conscientiousness may explain why firm allegiances to goals, values, and beliefs for the future are driven by a tendency to strive for perfection. Adolescents who are self-

oriented perfectionists could feel inherently committed to their self-set goals and this commitment may manifest itself also in their allegiance to goals they pursue for the future. This type of perfectionism may seem adaptive in the context of cultural changes that promote competitive individualism and meritocracy beliefs, stressing the absolute responsibility of the self for the future (Curran & Hill, 2019). Hence, the more an adolescent links their perfectionistic goals and strivings to firm commitments to future goals and plans, the more this responsibility of the self for the future is validated. As both constructs are supported by the personality trait of conscientiousness, their relation may seem natural and inherent for self-oriented perfectionists which may explain how this form of perfectionism is insidiously integrated into personal identity in adolescence. However, there may also be some dangers inherent to this relation. In many contexts, an absolute responsibility of the self for self-development is not feasible, as many variables involved in this process are outside adolescents' control (e.g., relational factors, systems of normative evaluations, socio-cultural and economic context). This may prompt adolescents to further maintain and consolidate very rigid commitments for the future in an attempt to "keep face" and demonstrate to the self that past personal choices were the best possible choices.

Research has shown that adolescents high in self-oriented perfectionism are more academically productive and emotionally stable (Bong et al., 2014; Damian, Stoeber, et al., 2017a; Vois & Damian, 2020). Additionally, strong identity commitments regarding goals and future plans confer adolescents a clear sense of meaning in life (Negru-Subtirica et al., 2016). These links with positive, constructive emotions, attitudes, and behaviors could contribute to the longitudinal relations we depicted. Self-oriented perfectionism and strong identity commitments stem in the self and reflect self-management endeavor (Hewitt et al., 2017). Hence, it may be that an increasing focus on setting and pursuing perfectionistic goals ("I want to be the very best in

everything I do") becomes more central and relevant to the self when it is linked with adhering to important personal goals and values for the future. This may be a mechanism through which self-oriented perfectionism is fostered and reinforced, hence gradually becoming a pervasive personality disposition. This positive link could further foster negative outcomes in terms of personal difficulties to experience satisfaction from success and heightened negative perception of failures (Curran & Hill, 2019; Hewitt et al., 2017). Nevertheless, positive and negative outcomes of these relations need to be further explored.

Socially Prescribed Perfectionism Predicts Ruminative Exploration, and Vice Versa

Our study found a positive bidirectional link between socially prescribed perfectionism and ruminative exploration. Adolescents high in this personality disposition tend to over-analyze through rumination and worry their path for the future, and this maladaptive examination then further fosters their socially prescribed perfectionism. This relation can be seen in light of the social disconnection and increased stress associated with exceedingly high performance expectations of significant others in socially prescribed perfectionism (Hewitt et al., 2017). Perfectionism cognition theory also points out that perfectionism is highly associated with prolonged rumination, due to an excessive focus on cues that may indicate failure or negative social evaluation (Flett, Hewitt, Nepon, & Besser, 2018). Such excessive cognitive activation and overthinking, stimulated by social pressure, may encourage rumination and worry about core personal goals and future plans, making the self even more vulnerable to the evaluative pressure of others. Thus, a vicious circle is created between socially prescribed perfectionism and ruminative exploration, as they mutually reinforce each other.

These findings corroborate evidence from previous research, showing that socially prescribed perfectionism and ruminative exploration are longitudinally associated with impaired emotional functioning (Chen et al., 2019). Socially prescribed perfectionism was linked to

anxiety symptoms (Damian, Negru-Subtirica et al., 2017) and difficulties in emotion regulation (Vois & Damian, 2020), while ruminative exploration was linked with depressive symptoms (Becht et al., 2019; Hatano et al., 2020). Additionally, Xie et al.'s (2019) meta-analytic study showed strong positive relations of socially prescribed perfectionism with worry and rumination. Hence, it may be that these negative emotional associations contribute to the creation of the vicious circle. Adolescents may try to cope with the excessive performance expectations they believe others have by ruminating over the appropriateness of their future plans, while this ruminative exploration will further drive them to search for the approval of others and aim for the perceived performance standards set by others. As both constructs are high in social evaluation and social comparison, they may feed into each other as a maladaptive coping mechanism reducing the unbearable emotional burden associated with them. Additionally, adolescents high in ruminative exploration have lower assertiveness (i.e., extraversion) and they do not have a direction for their future (Luyckx et al., 2014), indicating that they may not have the personal resources necessary for approaching social evaluations from significant others.

Adolescents high in socially prescribed perfectionism tend to view people who are important to them (e.g., parents, friends) as dissatisfied with and criticizing the quality of their actions (e.g., "I am never good enough for them"). This defeatist stance of "me against them" is self-debilitating for individuals who think others are the enemy out to get you (Smith et al., 2020). The social disconnection model of perfectionism views this negative perception of others' performance expectations and evaluations at the core of socially prescribed perfectionists' disengagement from and hostility towards social interactions (Hewitt et al., 2017). According to our findings, these negative social attitudes seem to feed into the personal evaluation of goals and future plans, making adolescents doubt the correctness of their choices. Planning for the future is an inherently social pursuit as the self exists and develops in social networks (Crone &

Dahl, 2012). This is even more important in adolescence, when significant others channel, inform, and model personal development (Crone & Fuligni, 2020). Hence, the more adolescents view their social environment as hostile and overbearing in terms of unrealistically high performance expectations, the more they feel unsure and emotionally burdened about their life goals and values.

Our finding that increases in ruminative exploration also fed into increases in socially prescribed perfectionism brings forward the paramount role of personal identity pursuits in adolescence. Reviews on self-formation in this developmental timeframe (e.g., Meeus, 2016) pointed out that adolescents have a strong need to (co)construct coherent goals for the future. Hence, the more they have a clear picture of their future, the more adapted they are at personal and social levels. The self is anchored in social functioning, and failures at the level of personal goals may make adolescents turn to the social validation of significant others. This evidence brings forward how the immense pressure of uncertainty and worry about self-set goals (i.e., ruminative exploration) can in turn drive maladaptive goals that are externally motivated and beliefs about others that are dysfunctional (i.e., socially prescribed perfectionism).

Exploration in Depth: Adaptive or Maladaptive?

Finally, our findings indicated that self-oriented perfectionism prompted within-person changes in in-depth investigation of future goals, while this thorough analysis of future goals triggered within-person increases in socially prescribed perfectionism. The positive link we found from self-oriented perfectionism to exploration in depth can shed light on the dynamic of the identity evaluation cycle. The identity evaluation cycle integrates exploration in depth as a specialized, thorough analysis of an existing commitment to reach an identification with or internalization of that commitment. This cycle strengthens commitments by integrating personal goals, plans, and values into the self-system (Luyckx et al., 2006).

The high personal standards for performance organized around self-defining pursuits seem to work as a positive catalyst for the integration of future goals and plans into the self-system. It may be that self-oriented perfectionism contributes to involvement in thorough exploration of the future because it relates to more positive affect (Damian et al., 2014b) and positive emotional regulation (Vois & Damian, 2020) and hence positively enhances the subjective experience of working toward goal commitment. Exploration of current identity commitments has also been linked to active evaluation of self-relevant information (Negru-Subtirica et al., 2017). Therefore, adolescents who are self-oriented perfectionists may see this as a personal validation of the correctness of their exceedingly high expectations for performance and success. This relation may prove maladaptive in the long-term, as these adolescents could inherently link their very perfectionistic expectations for success to firm identity commitments, always expecting to be "in the know" and finding uncertainty and failure intolerable.

The differential longitudinal link we found from exploration in depth to within-person changes in socially prescribed perfectionism brings forward the double-edged nature of identity exploration in depth. Previous studies have pointed out that in novel and complex situations exploration in depth may make adolescents more distressed and more prone to behavioral transgressions (Crocetti et al., 2008; Hatano et el., 2020). Planning and setting goals for the future are novel developmental tasks in adolescence (Crone & Dahl, 2012), and exploration in depth is part of the identity evaluation cycle. Hence, it may be that as adolescents engage in thorough examination of their chosen future path(s), in order to further evaluate their choices for the future, this novel endeavor could be too difficult and complex. The pressure to make "the best" choice for the future may turn them to performance standards set by significant others as a means of getting closer to these "best" choices. Others may be seen as having more expertise and credibility in the types of goals they push forward and validate (e.g., parents, teachers).

Therefore, increasing exploration in depth may, across time, make adolescents more vulnerable to very high expectations set by others.

Limitations and Future Directions

Our interpretation of the present study's findings, however, needs to be evaluated against a series of limitations that we see as caveats, but may also inform future studies examining longitudinal relations between identity and perfectionism. First, we measured identity at a global level. Previous research, however, has shown that identity may be domain-specific and adolescents may have different identities in different domains of life (e.g., education, career, health, religion, gender; Negru-Subtirica & Pop, 2018; Negru-Subtirica, Pop, & Crocetti, 2018) so future research may profit from analyzing the perfectionism–identity formation relations in adolescent development from a domain-specific perspective using multiple measures for each construct. Such studies consider the level of centrality of certain life and ideological domains for a person and centrality refers to how important and self-relevant a life-domain is for an adolescent (Settles, 2004). For instance, education may be low in self-relevance for an adolescent while physical appearance may be central to their self-system. Hence, by depicting perfectionism and identity in multiple life-domains high in centrality, we can shed more light on how adolescents negotiate and integrate their self-perceptions into a coherent sense of self. The use of multiple measures for perfectionism and identity, tapping into different dimensions and processes of each construct, could bring forward their multi-layered nature and their complex interactions across time, at global and domain-specific levels.

Second, our findings are relevant from a cultural perspective, reflecting the role of perfectionism in the identity formation of young people (Curran & Hill, 2019). Nevertheless, we did not tap into specific cultural orientations of adolescents. Culture has a pervasive and multi-layered influence in the process of self-formation (Markus & Kitayama, 2010) and future studies

could focus on directly assessing the role of culture in the relation between identity and perfectionism. By examining general cultural orientations (e.g., individualism versus collectivism) together with, for instance, specific dimensions of meritocracy beliefs (e.g., McCoy, Wellman, Cosley, Saslow, & Epel, 2013), we can gain a better understanding of how perfectionism and identity are shaped by cultural changes.

Third, previous research found conscientiousness to play a role in the development of perfectionism in adolescence (Stoeber et al., 2009). The present study, however, did not include this personality trait. Future longitudinal work could integrate measures of personality traits like conscientiousness to tap into their role in the perfectionism–identity interplay across adolescence. Fourth, the present study relied exclusively on quantitative measures of perfectionism and identity processes. Though these measures provide valuable information on the development of both constructs, in future studies they could be complemented with qualitative or mixed-method approaches (e.g., Hewitt et al., 2017; Reese et al., 2017). Such approaches could tap into how adolescents subjectively construct and link their perfectionism with their identity in the domain of future plans. Last, future studies could focus on intra-individual profiles of perfectionism and identity across time (e.g., latent profile and latent transition analyses), to investigate intra-individual variability and change in these constructs (Crocetti & Meeus, 2015).

Conclusions

This four-wave study investigated longitudinal associations between perfectionism and identity in adolescence. Results showed that self-oriented perfectionists link their self-worth to strong commitments for the future, for the identity formation (i.e., commitment making) and identity evaluation (i.e., identification with commitment, exploration in depth) cycles. We further found that adolescents high in socially prescribed perfectionism tend to over-analyze, through

rumination and worry, their path for the future and that this ruminative exploration in turn feeds into their socially prescribed perfectionism. Additionally, exploration in depth of future plans and goals sustains the perception that others have exceedingly high performance expectations. These novel findings highlight that in times of cultural change young generations tend to integrate perfectionism into their personal identity-formation. This link possibly creates a developmental vicious cycle, in which self-formation is molded according to exceedingly high self-set and other-set performance expectations.

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Table 1

Reliabilities, Descriptive Statistics, and Correlations between Perfectionism and Identity Processes

	Reliabilities	Descriptives	Perfectionism							
			Self-oriented perfectionism				Socially prescribed perfectionism			
Identity Processes	α	*M* (*SD*)	T1	T2	T3	T4	T1	T2	T3	T4
Commiment making T1	.91	3.40 (1.02)	.30***	.25***	.21***	.13***	.21***	.20***	.11**	.10**
Commiment making T2	.91	3.41 (0.98)	.30***	.30***	.30***	.20***	.10**	.13***	.03	.05
Commiment making T3	.91	3.54 (0.99)	.20***	.20***	.30***	.21***	.11**	.11**	.07	.06
Commiment making T4	.92	3.50 (1.03)	.23***	.20***	.30***	.30***	.04	.03	.01	.10**
Identification with commitment T1	.87	3.42 (0.94)	.32***	.30***	.25***	.20***	.29***	.20***	.14***	.11**
Identification with commitment T2	.89	3.44 (0.93)	.30***	.33***	.32***	.22***	.13***	.14***	.10**	.06
Identification with commitment T3	.89	3.60 (0.94)	.22***	.23***	.31***	.20***	.12**	.13***	.10**	.04
Identification with commitment T4	.89	3.52 (0.93)	.21***	.20***	.30***	.30***	.10**	.10**	.05	.10**
Exploration in breadth T1	.84	3.70 (0.88)	.30***	.23***	.24***	.21***	.30***	.23***	.21***	.15***
Exploration in breadth T2	.86	3.60 (0.88)	.20***	.30***	.30***	.20***	.20***	.20***	.15***	.12**
Exploration in breadth T3	.84	3.70 (0.87)	.12**	.20***	.32***	.22***	.12**	.20***	.21***	.11**

Exploration in breadth T4	.82	3.60 (0.83)	.20***	.20***	.23***	.30***	.11**	.14***	.10**	.12**
Exploration in depth T1	.82	3.20 (0.89)	.31***	.30***	.30***	.22***	.30***	.30***	.24***	.23***
Exploration in depth T2	.82	3.22 (0.88)	.23***	.30***	.31***	.23***	.20***	.23***	.20***	.20***
Exploration in depth T3	.83	3.40 (0.91)	.20***	.20***	.34***	.23***	.14***	.20***	.23***	.18***
Exploration in depth T4	.81	3.34 (0.83)	.20***	.20***	.26***	.24***	.10**	.14***	.14***	.16***
Ruminative exploration T1	.82	2.80 (0.99)	.06	.05	.03	.10**	.21***	.20***	.21***	.20***
Ruminative exploration T2	.84	2.83 (0.95)	.01	.07	.06	.04	.20***	.23***	.30***	.30***
Ruminative exploration T3	.87	2.83 (1.04)	-.03	.04	.15***	.12**	.20***	.21***	.34***	.30***
Ruminative exploration T4	.84	2.90 (0.95)	-.01	.04	.12**	.12**	.11**	.11**	.20***	.21***
α			.77	.84	.83	.81	.84	.84	.83	.84
M (*SD*)			3.23 (0.61)	3.14 (0.61)	3.17 (0.61)	3.20 (0.58)	2.74 (0.76)	2.70 (0.71)	2.73 (0.72)	2.80 (0.71)
M (*SD*), total scores			38.57 (7.17)	37.78 (7.36)	37.93 (7.42)	38.20 (6.98)	27.33 (7.62)	26.46 (7.08)	27.28 (7.30)	27.81 (7.06)

Note. T1 = Time 1, T2 = Time 2, T3 = Time 3, T4 = Time 4; α = Cronbach's alpha; $^{**}p < .01$, $^{***}p < .001$.

Table 2

Fit Statistics and Model Comparison for Longitudinal Measurement Invariance of Identity Processes and Perfectionism Scales

	Model fit indices				Model comparison					
Models	χ_{SB}^2	*df*	CFI	RMSEA [90% CI]	Models	$\Delta\chi_{SB}^2$	Δdf	*P*	ΔCFI	ΔRMSEA
Identity Processes										
Model 1: Configural	7975.81	4502	.897	.032 [.031-.033]						
Model 2: Metric	8066.24	4562	.896	.032 [.031-.033]	M2-M1	87.19	60	.012	-.001	.000
Model 3: Scalar	8299.43	4637	.892	.033 [.031-.034]	M3-M2	244.93	75	.000	-.004	.001
Perfectionism										
Model 1: Configural	273.80	188	.987	.025 [.018-.031]						
Model 2: Metric	296.40	200	.985	.025 [.019-.031]	M2-M1	22.80	12	.029	-.002	.000
Model 3: Scalar	360.15	218	.978	.030 [.024-.035]	M3-M2	67.47	18	.000	-.007	.005

Note. CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation and 90% confidence interval (CI); $\Delta\chi_{SB}^2$ model comparisons are based on Satorra and Bentler's (2001) scaled difference chi-square test statistic.

Table 3

Latent Difference Score Models (LDS): Fit Indices and Model Comparisons

	Model fit indices					Model comparison					
Models	χ_{SB}^2	*df*	n_{par}	CFI	RMSEA [90% CI]	Models	$\Delta\chi_{SB}^2$	Δdf	*P*	ΔCFI	ΔRMSEA
M1 (LDS_Model 1)	367.048	105	357	.962	.058 [.052-.065]						
M2 (LDS_Model 2)	406.747	182	282	.968	.041 [.035-.046]	M2-M1	49.994	77	.992	.006	-.017

Note. M1 = Model 1; M2 = Model 2; n_{par} = number of free parameters; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation and 90% confidence interval (CI); $\Delta\chi_{SB}^2$ model comparisons are based on Satorra and Bentler's (2001) scaled difference chi-square test statistic.

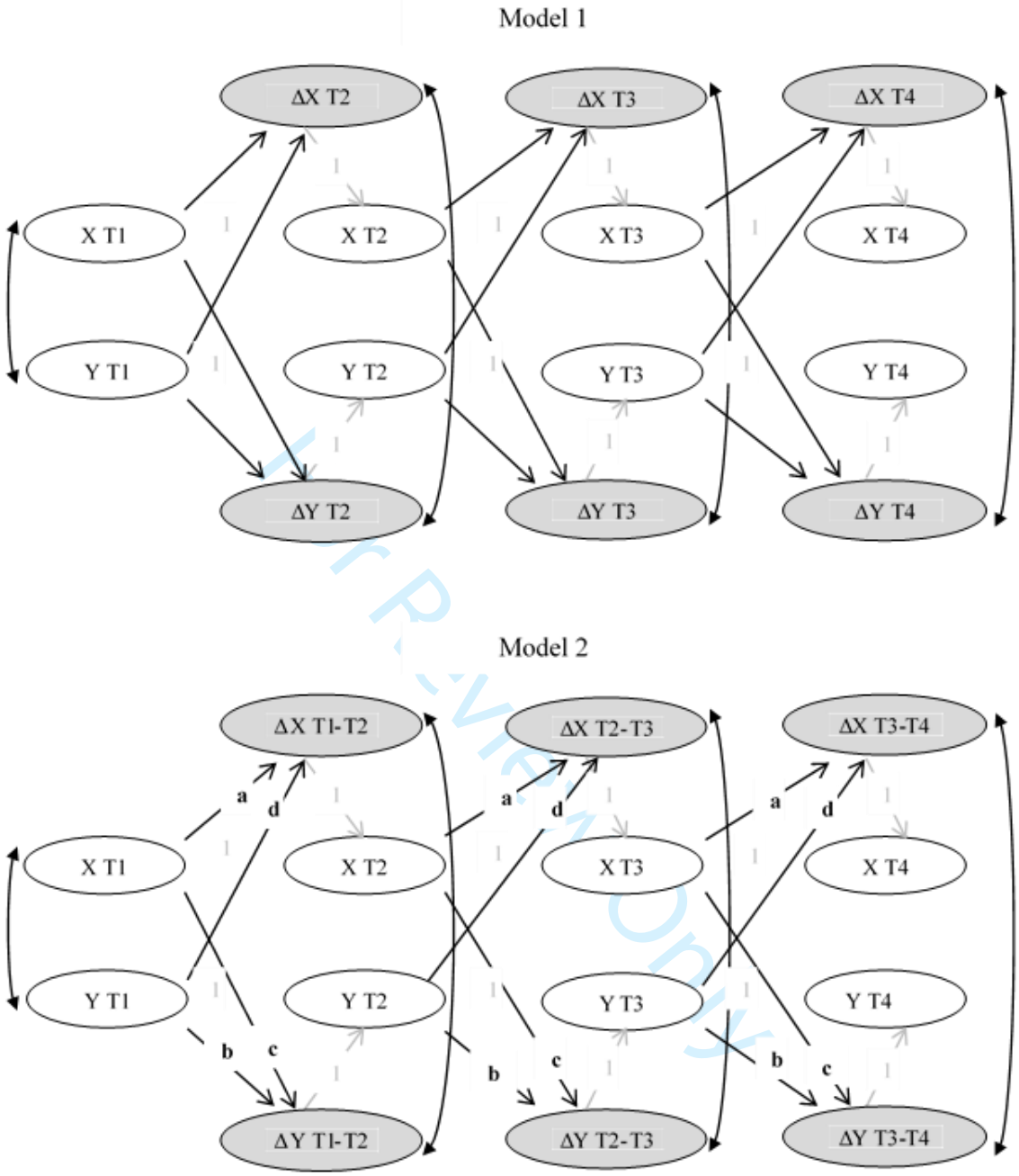

Figure 1. Latent difference score (LDS) models for two indicators and four measurement occasions. Model 1 = baseline LDS unconstrained model; Model 2 = LDS model with cross-lagged paths between latent variables and latent difference score variables constrained to be time-invariant. X = variable 1, Y = variable 2; T = Time; ΔX T1-T2 = change in X from T1 to T2, ΔX T2-T3 = change in X from T2 to T3, ΔX T3-T4 = change in X from T3 to T4, ΔY T1-T2 = change in Y from T1 to T2, ΔY T2-T3 = change in Y from T2 to T3, ΔY T3-T4 = change in Y from T3 to T4.

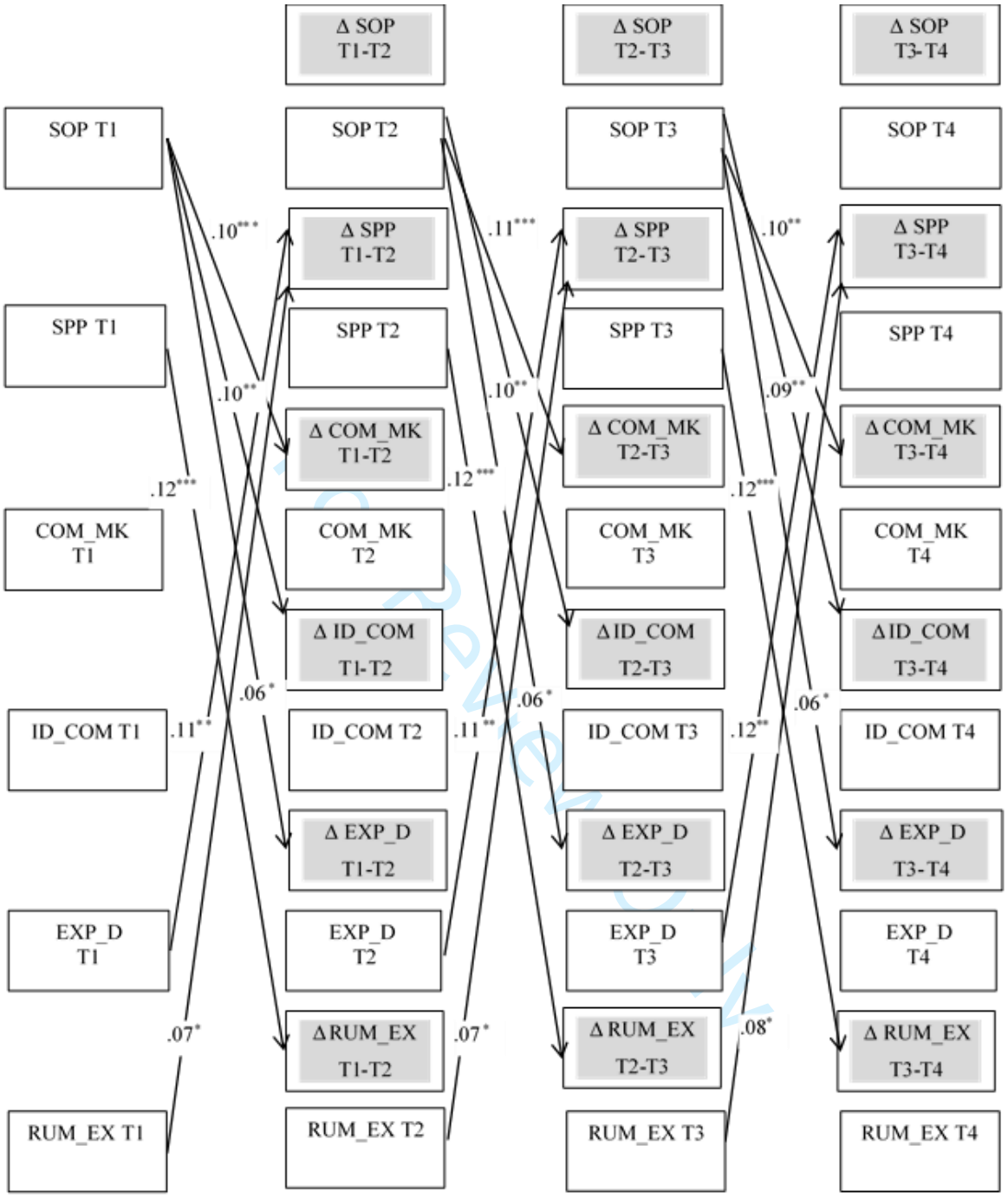

Figure 2. Standardized estimates of the change regression latent difference score model linking perfectionism and identity processes (LDS model with cross-lagged paths constraint to be fixed) with gender as covariate. For the sake of clarity, only significant relations are shown. SOP = self-oriented perfectionism, SPP = socially prescribed perfectionism, COM_MK = commitment making, ID_COM = identification with commitment, EXP_D = exploration in depth, RUM_EX = ruminative exploration. T = Time. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Supplemental Material

Table S1

Correlations between Perfectionism Dimensions

		Self-oriented perfectionism			
Socially prescribed perfectionism		T1	T2	T3	T4
	T1	.44***	.33***	.28***	.24***
	T2	.29***	.44***	.38***	.30***
	T3	.32***	.38***	.47***	.35***
	T4	.23***	.28***	.34***	.41***

Note. T1 = Time 1, T2 = Time 2, T3 = Time 3, T4 = Time 4.

***$p < .001$.

Table S2

Correlations between Identity Processes

	Commiment making				Identification with commitment				Exploration in breadth				Exploration in depth			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
Identification with commitment																
T1	.75***	.49***	.44***	.39***												
T2	.53***	.80***	.62***	.47***												
T3	.49***	.59***	.82***	.56***												
T4	.39***	.49***	.55***	.83***												
Exploration in breadth																
T1	.27***	.16***	.20***	.19***	.36***	.16***	.21***	.18***								
T2	.19***	.35***	.22***	.27***	.21***	.36***	.21***	.25***								
T3	.11*	.16**	.27***	.23***	.17***	.19***	.28***	.23***								
T4	.12*	.19***	.15**	.38***	.23***	.24***	.17**	.39***								

Exploration in depth

T1	.43***	.30***	.32***	.26***	.51***	.33***	.36***	.28***	.67***	.44***	.35***	.36***
T2	.27***	.44***	.32***	.27***	.28***	.48***	.33***	.30***	.42***	.73***	.43***	.39***
T3	.20***	.30***	.44***	.28***	.27***	.34***	.47***	.29***	.36***	.46***	.68***	.46***
T4	.17**	.26***	.24***	.46***	.25***	.31***	.25***	.49***	.29***	.43***	.47***	.70***

Ruminative exploration

T1	-.30***	-.29***	-.17***	-.12*	-.23***	-.27***	-.16**	-.11*	.41***	.21***	.25***	.20***	.27***	.14**	.17***	.16**
T2	-.18***	-.30***	-.21***	-.15**	-.12**	-.24***	-.21***	-.16**	.26***	.35***	.33***	.19***	.20***	.28***	.20***	.17**
T3	-.21***	-.31***	-.29***	-.22***	-.11*	-.26***	-.27***	-.20***	.13**	.17***	.38***	.22***	.08	.09	.29***	.18***
T4	-.16**	-.19***	-.23***	-.23***	-.11*	-.12*	-.23***	-.21***	.13**	.18***	.20***	.31***	.12*	.16**	.16**	.33***

Note. T1 = Time 1, T2 = Time 2, T3 = Time 3, T4 = Time 4.

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

Table S3

Correlations of Gender (0 = boys, 1 = girls) with Perfectionism Dimensions and Identity Processes

	Gender (female)			
	T1	T2	T3	T4
Perfectionism Dimensions				
Self-oriented perfectionism	.01	.05	-.03	.04
Socially prescribed perfectionism	.00	.07	-.06	.01
Identity Processes				
Commiment making	.01	-.02	-.06	-.02
Identification with commitment	-.02	-.07	-.04	.00
Exploration in breadth	-.07	-.03	.02	-.04
Exploration in-depth	-.05	-.02	-.02	-.02
Ruminative exploration	.01	-.03	.01	.04

Note. T1 = Time 1, T2 = Time 2, T3 = Time 3, T4 = Time 4.

Table S4

Standardized Estimates of Longitudinal Paths between Level and Change in Perfectionism and Identity Processes

Cross-lagged paths	T1 → T2	T2 → T3	T3 → T4
Longitudinal associations between perfectionism dimensions level and change			
SOP → Δ SPP	.06*	.07	.07*
SPP → Δ SOP	.08*	.07*	.08*
Longitudinal associations between identity processes level and change			
COM_MK → Δ ID_COM	.18***	.18***	.18***
COM_MK → Δ EXP_B	-.03	-.03	-.03
COM_MK → Δ EXP_D	.03	.03	.03
COM_MK → Δ RUM_EX	-.14***	-.14***	-.14***
ID_COM → Δ COM_MK	.14**	.15**	.14**
ID_COM → Δ EXP_B	.01	.01	.01
ID_COM → Δ EXP_D	.00	.00	.00
ID_COM → Δ RUM_EX	-.09*	-.09*	-.08*
EXP_B → Δ COM_MK	.02	.02	.02
EXP_B → Δ ID_COM	-.01	-.01	-.01
EXP_B → Δ EXP_D	.11**	.11**	.12**
EXP_B → Δ RUM_EX	.06	.06	.06
EXP_D → Δ COM_MK	.02	.02	.02
EXP_D → Δ ID_COM	.06	.06	.06

EXP_D → Δ EXP_B	.13***	.14***	.16***
EXP_D → Δ RUM_EX	.07	.07	.07
RUM_EX → Δ COM_MK	-.11**	-.11**	-.11**
RUM_EX → Δ ID_COM	-.12***	-.12***	-.12***
RUM_EX → Δ EXP_B	.05	.05	.06
RUM_EX → Δ EXP_D	.02	.02	.02

Note. SOP = self-oriented perfectionism, SPP = socially prescribed perfectionism, COM_MK = commitment-making, ID_COM = identification with commitment, EXP_B = exploration in-breadth, EXP_D = exploration in-depth, RUM_EX = ruminative exploration, T = Time, Δ = denotes latent difference variable.

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

Table S5

Standardized Estimates of Cross-Lagged Paths between Participants' Gender (0 = Boys, 1 = Girls) and Change in Perfectionism and Identity Processes

Cross-lagged paths	T1 → T2	T2 → T3	T3 → T4
Longitudinal associations between gender and change in perfectionism dimensions			
Gender → Δ SOP	.03	.00	.09*
Gender → Δ SPP	-.02	-.02	-.02
Longitudinal associations between gender and change in identity processes			
Gender → Δ COM_MK	-.00	-.04	.11*
Gender → Δ ID_COM	-.02	-.02	.07
Gender → Δ EXP_B	.09**	.15***	.16***
Gender → Δ EXP_D	.05	.08	.14***
Gender → Δ RUM_EX	-.04	-.01	-.03

Note. SOP = self-oriented perfectionism, SPP = socially prescribed perfectionism, COM_MK = commitment-making, ID_COM = identification with commitment, EXP_B = exploration in-breadth, EXP_D = exploration in-depth, RUM_EX = ruminative exploration, T = Time, Δ = denotes latent difference variable.

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

Procedures for the Confirmatory Factor Analyses

For the Child-Adolescent Perfectionism Scale (CAPS), we aggregated the individual items into combined scores (parcels) and then used these parcels instead of the individual items because, by using parcels instead of multiple individual items, models become more parsimonious. To create the parcels, the well-established item-to-construct balance (ICB) parceling method was used (Little, Cunningham, Shahar, & Widaman, 2002). Specifically, we created three parcels (each consisting of four items) for each subscale of the CAPS, because the use of three indicators per latent variable is considered optimal (Little et al. 2002; Matsunaga, 2008). For self-oriented perfectionism, Parcel 1 comprised four items ("I feel that I have to do my best all the time", "I don't always try to be the best", "When I do something, it has to be perfect", and "Even when I pass, I feel that I have failed if I didn't get one of the highest marks in the class"); Parcel 2 comprised four items ("I always try for the top score on a test", "It really bothers me if I don't do my best all the time", "I get upset if there is even one mistake in my work", and "I do not have to be the best at everything I do"); and Parcel 3 comprised 4 items ("I try to be perfect in everything I do", "I want to be the best at everything I do", "I get mad at myself when I make a mistake", and "I can't stand to be less than perfect"). For socially prescribed perfectionism, Parcel 1 comprised three items ("People expect more from me than I am able to give", "Other people think I have failed if I do not do my very best all the time", and "Other people always expect me to be perfect"); Parcel 2 comprised three items ("People around me expect me to be great at everything", "I am always expected to do better than others", and "I feel that people ask too much of me"); and Parcel 3 comprised four items ("My parents don't always expect me to be perfect in everything I do", "There are people in my life who expect me

to be perfect", "My family expects me to be perfect", and "My teachers expect my work to be perfect").

For the Dimensions of Identity Developmental Scale (DIDS), following previous studies that analyzed the factor structure of the DIDS (e.g., Mastrotheodoros & Motti-Stefanidi, 2017; Negru-Subtirica, Pop, Luyckx, Dezutter, & Steger, 2016), we used an individual item procedure. Specifically, for each identity latent factor we used five indicators (individual items). Further, we used modification indices and allowed two error covariances between similarly worded items to load on the same latent factor (i.e., Item ["Think about the direction I want to take in my life"] and Item ["Think a lot about how I see my future"] from the exploration in breadth subscale; and Item ["Try to find out regularly what other people think about the specific direction I want to take in my life"] and Item ["Talk regularly with other people about the plans for the future I have made"] from the exploration in depth subscale).

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