A Developmental Typology of Adolescent Personality

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Abstract

The purpose of the current study is to examine whether Block's personality types (i.e. Resilients, Undercontrollers and Overcontrollers) are replicable as developmental trajectories. We applied a Latent Class Growth Analysis (LCGA) framework to five-annual-wave data on a sample of early to middle adolescents (n = 923). Our results showed that Block's Resilients, Undercontrollers and Overcontrollers are indeed replicable as developmental trajectories across adolescence. These developmental types were related to problem behaviour in a similar way as types found in studies using cross-sectional data. As such, Resilients reflected low levels of problem behaviour, Undercontrollers had high levels of delinquency and Overcontrollers had high levels of depression. Implications and suggestions for further research are discussed. Copyright © 2009 John Wiley & Sons, Ltd.

INTRODUCTION

The most commonly used person-centred approach to personality was introduced by Block and Block (1980). They proposed three personality types: Resilients, Undercontrollers and Overcontrollers. These three types differ in their amount of ego-control and ego-resiliency. Ego-control indicates the degree of impulse control, whereas ego-resiliency refers to the capacity of a person to modify levels of ego-control as a function of environmental demands. Resilients are characterized by high levels of ego-resiliency, and are, as a result, well able to adjust their levels of ego-control to environmental demands. Both Overcontrollers and Undercontrollers reflect low levels of ego-resiliency, but whereas Overcontrollers are characterized by high levels of ego-control, Undercontrollers are

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characterized by low levels of ego-control. Personality types are by no means perfectly discrete entities, as boundaries between types may be somewhat fuzzy (Asendorpf, Borkenau, Ostendorf, & van Aken, 2001). That is, relatively small differences on a certain trait can, for example, result in an individual being classified as a Resilient instead of as an Overcontroller. Nevertheless, the value of the types as a non-arbitrary multivariate classification has been proofed in a wide range of studies, involving children, adolescents and adults (e.g. Asendorpf et al., 2001).

In a sample of adolescent boys, Robins, John, Caspi, Moffitt and Stouthamer-Loeber (1996) demonstrated that Resilients, Overcontrollers and Undercontrollers have specific Big Five personality profiles. Resilients had the best adjusted personality profile of the three types, reflected by the highest scores on four of the Big Five personality dimensions: Conscientiousness, emotional stability, openness to experience and extraversion. On the fifth dimension, agreeableness, Resilients had above average scores, but Overcontrollers had the highest scores. Compared to the two other types, Overcontrollers had the lowest scores on extraversion and emotional stability and Undercontrollers had the lowest scores on agreeableness and conscientiousness. These findings have been replicated several times (for overviews, see for example: Hart, Atkins, & Fegley, 2003; van Lieshout, 2000), and later studies demonstrated that adolescent personality types can be constructed directly from Big Five questionnaire data (e.g. Akse, Hale, Engels, Raaijmakers, & Meeus, 2004; Asendorpf et al., 2001; Dubas, Gerris, Janssens, & Vermulst, 2002). With regard to gender differences, boys usually are over-represented among Undercontrollers (e.g. Akse et al., 2004; Asendorpf et al., 2001), while girls tend to be over-represented among Resilients and/or Overcontrollers (e.g. Akse et al., 2004; Dubas et al., 2002). Several studies further demonstrated that Resilients, Undercontrollers and Overcontrollers have distinctive patterns of problem behaviour (e.g. Akse et al., 2004; Robins et al., 1996). Resilients usually display little problem behaviour, Undercontrollers are described by high levels of externalizing problems (e.g. delinquency) and Overcontrollers by high levels of internalizing problems (e.g. depression). Denissen, Asendorpf and van Aken (2008) showed that personality types are not only concurrently related to problem behaviour, but also demonstrated that these types can also longitudinally predict shyness and aggressiveness. In addition, the childhood personality types derived by Denissen *et al.* (2008) even longitudinally predicted the timing of demographic transitions, such as leaving the parental home, establishing a romantic relationship and finding a job. Thus, personality types are powerful predictors of current and later adjustment, and demographic transitions.

In the aforementioned studies, the emphasis is on the classification of individuals into a certain personality type at a certain measurement occasion. It is also possible to examine personality types from a developmental perspective. One way to assess development within a typological framework is to examine stability and change in personality type membership across different time points. Previous studies that used this approach to examine long-term stability of type membership in childhood (Asendorpf & van Aken, 1999), from childhood to adolescence (Asendorpf, 2003) and in adolescence (Akse, Hale, Engels, Raaijmakers, & Meeus, 2007; van Aken & Dubas, 2004) found that more than 40% of individuals changed from one type to another. This could possibly be attributed to the previously mentioned fuzzy boundaries between personality types. In addition, studying transitions from one static type to another static type across several measurement occasions can result in serious interpretation problems. For example, examining transitions between three types across three waves results in $3^3 = 27$ possible cross-time personality types (van Aken & Dubas,

2004). Another problem is that individual developmental trajectories and normative development within personality types are lost in such an approach (e.g. Block, 1971), as transitions across waves between types that have been constructed using the same cluster means could actually be caused by normative developmental changes in the underlying personality traits.

Therefore, Block (1971) originally made a case for studying '*types of personality development*, not *types of personality*' (p. 113). According to Block, a personality typology should reflect the way personality types manifest themselves during longer and substantial periods in the life course. In other words, personality types should incorporate normative developmental trends in personality. He stated that 'we need to be able to plot the various separate trend-lines of our personality types, attending both to the cross-sectional comparisons available at each slice of time and to the directions and significance of the changes observed over the years' (p. 113).

Only three studies have taken a true developmental approach to the study of personality types. Block (1971) was the first to study a developmental typology of personality; his study focused on the period from adolescence into adulthood. Block's typology was, however, only based on small samples of men and women (84 and 86 participants, respectively). Nevertheless, it inspired Morizot and Le Blanc (2003, 2005) three decades later to re-examine a developmental typology of personality from adolescence into adulthood (across ages 14, 16, 30 and 40) in a sample of men who had been in jail before the onset of the study (Morizot & Le Blanc, 2003) and in a sample of men drawn from the general population (Morizot & Le Blanc, 2005). In both studies four developmental types were found, but in both cases three of these four developmental personality types were comparable to the personality types that are typically found in cross-sectional studies (i.e. Resilients, Undercontrollers and Overcontrollers). Thus, non-developmental personality types are at least to some extent replicable as developmental personality types.

In the current study, we will investigate a developmental personality typology for early to middle adolescent boys and girls (ages 12–16) using data from a large-scale ($N = 923$) five-annual-wave longitudinal research project. We will thereby extend the studies of both Block (1971) and Morizot and LeBlanc (2003, 2005), who focused on small samples of men and covered the period from adolescence into adulthood with only a limited number of measurement occasions in adolescence. Furthermore, for the identification of longitudinal personality types, the earlier mentioned studies have used methods such as Q-factor analysis and longitudinal cluster analysis, which do not take measurement error into account. The present study uses Latent Class Growth Analysis (LCGA; Nagin, 1999, 2005), a relatively new technique that allows to identify several homogeneous groups within a heterogeneous sample, based on the initial levels (referred to as intercepts) and growth rate (referred to as slopes) of individuals on a certain set of variables (i.e. Big Five personality characteristics), while controlling for measurement error. It should be noted that LCGA and similar techniques do not create perfectly discrete types (Johnson, Hicks, McGue, & Iacono, 2007). Boundaries between types are at best fuzzy, just like the boundaries between types derived in cross-sectional studies are (Asendorpf et al., 2001).

In the current study, we expect to find at least three developmental personality types, resembling the three 'static' personality types consistently found in previous studies: Resilients, Undercontrollers and Overcontrollers. In addition, we will examine how our longitudinal trajectories of personality are associated with internalizing (i.e. depression) and externalizing (i.e. delinquency) problem behaviour. Finally, gender differences in the prevalence of developmental personality types will be explored.

METHOD

Participants

Data for this study were collected as part of an ongoing longitudinal research project on CONflict And Management Of RElationships (CONAMORE; Meeus et al., 2006). Data of the first five annual measurement waves were used. The longitudinal sample consisted of 923 early to middle adolescents (468 boys and 455 girls; $M_{age} = 12.4$ years ($SD = .59$) during the first wave of measurement), who attended various randomly selected high schools in the province of Utrecht, The Netherlands. With regard to ethnicity, 83.4% identified themselves as Dutch and 16.6% indicated that they belonged to ethnic minorities (e.g. Surinamese, Antillean, Moroccan, Turkish). As these figures were 79 and 21%, respectively, in the general Dutch adolescent population (Statistics Netherlands, 2008), Dutch youth was slightly over-represented. Because participants were distributed across all available levels in the Dutch educational system, and Socio-Economic Status ranged from high to low, our sample is quite representative for the general Dutch population of early to middle adolescents.

Sample attrition was 1.2% across waves. Missing item values were estimated in SPSS, using the EM-procedure. Across waves 5.2% of the data was missing. Little's Missing Completely at Random Test (Little, 1988) revealed a normed χ^2 (χ^2/df) of 1.31, which according to guidelines by Bollen (1989), indicates a good fit between sample scores with and without imputation.

Procedure

Participants and their parents received an invitation letter, describing the research project and goals, and explaining the possibility to decline from participation. More than 99% of the approached high school students decided to participate. All participants signed the informed consent form.

Measures

Personality
Personality was self-rated by participating adolescents, with the shortened Dutch version of Goldberg's Big Five questionnaire (Gerris, Houtmans, Kwaaitaal-Roosen, Schipper, Vermulst, & Janssens, 1998; Goldberg, 1992). This Likert-type measure, with a response format ranging from 1 (completely untrue) to 7 (completely true), was used to assess the Big Five personality dimensions. Each Big Five dimension was indicated by six items such as: talkative (extraversion), sympathetic (agreeableness), systematic (conscientiousness), worried (emotional stability, reversed scored) and creative (openness to experience). Reliability was acceptable at all included measurement waves, as Cronbach's αs across all Big Five scales ranged from .76 to .88.

Depression
Depressive symptoms were measured with the Children's Depression Inventory (CDI; Kovacs, 1985), a self-report questionnaire aimed at screening (subclinical) depressive symptomatology in children and adolescents. The CDI consists of 27 items (e.g. 'I'm sad all the time'). The items were scored on a three-point scale, ranging from 1 (false), to

3 (very true). Reliability of the CDI was high at all included measurement waves, with Cronbach's αs ranging from .89 to .94.

Delinquency

To measure delinquency, a self-report questionnaire measuring the frequency of several minor offences (Baerveldt, van Rossem, & Vermande, 2003) was used. The use of self-report data is widespread in criminology, and the instrument is valid when restricted to petty crime (Baerveldt, 2000). Adolescents were asked how many times they had committed 16 minor offences, such as stealing a bike and deliberately damaging or breaking something in the street, in the past 12 months. The items were scored on a four-point scale, ranging from 0 (never) to 3 (four times or more). Reliability was high at all included measurement waves, as Cronbach's αs ranged from .83 to .93.

RESULTS

We used LCGA (Nagin, 1999, 2005) to investigate a developmental typology of adolescent personality. In LCGA, homogeneous subgroups characterized by more or less the same level and change rate on a set of variables are derived from a heterogeneous sample. To determine whether there were such potential subgroups within our sample, we first assessed univariate Latent Growth Models (LGM; e.g. Duncan, Duncan, Stryker, Li, & Alpert, 1999), using M*plus* (Muthén & Muthén, 2007).

Univariate latent growth models

We specified univariate LGMs (growth factor loadings 0–4, for the five consecutive annual measurement waves, respectively) for all Big Five factors, to determine what kind of growth characterized our data best, and whether there was significant variance in growth (i.e. significant slope variance). The best models have the lowest χ^2 corrected for degrees of freedom (Satorra & Bentler, 2001) and Root Mean Square Errors of Approximation (RMSEA), and the highest Comparative Fit Indices (CFI) and Tucker Lewis Indices (TLI) (Kline, 2005).

For all Big Five factors, the best fitting models included linear and quadratic slopes.[1] Furthermore, intercepts and slopes within models were allowed to correlate, as this significantly improved model fit. Descriptive statistics are displayed in Table 1, fit indices of the univariate LGMs appear in Table 2.

As we were mainly interested in identifying different developmental trajectories of adolescents, we merely focused on variance around mean intercepts, and mean linear and/ or quadratic slope factors. For a discussion of mean-level changes for our sample as a whole, the reader is referred to Klimstra, Hale, Raaijmakers, Branje and Meeus (2009). Because we found significant variance around mean intercepts and slope factors, we could proceed to the next step: Identifying subgroups that displayed distinct developmental personality profiles with regard to initial levels (i.e. intercepts) and rates of change (i.e. slopes) for the Big Five personality factors with LCGA.

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[1]Model comparisons between models without quadratic growth factors and those including quadratic growth factors can be obtained from the first author upon request.

Table 1. Descriptive statistics of Big Five personality traits and problem behavior

	T1	T2	T3	T4	T5
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Personality					
Extraversion	4.91 (1.01)	4.84 (1.06)	4.90 (1.08)	4.85 (1.12)	4.94 (1.11)
Agreeableness	5.06 (1.08)	5.20 (.99)	5.16 (.93)	5.30 (.87)	5.44 (.74)
Conscientiousness	4.13 (1.11)	4.22 (1.16)	4.09 (1.16)	4.08 (1.18)	4.17 (1.20)
Emotional stability	4.64 (1.12)	4.48 (1.11)	4.59 (1.07)	4.60 (1.06)	4.63 (1.07)
Openness	4.39 (1.08)	4.58 (1.07)	4.48 (1.04)	4.60 (1.01)	4.70 (.99)
Problem behavior					
Depression	1.16 (.26)	1.18 (.23)	1.18 (.23)	1.19 (.24)	1.18 (0.21)
Delinquency	1.18 (.38)	1.13 (.28)	1.15 (.30)	1.15 (.28)	1.17 (.30)

Table 2. Fit indices, intercepts and growth parameters for univariate Latent Growth Curve Models

	χ^2	df	CFI	TLI	RMSEA	90% C.I. of RMSEA	Intercept		Linear slope		Quadratic slope	
							M	σ^2	*M*	σ^2	*M*	σ^2
Ex	15.90[*]	6	1.00	.99	.04	.02, .07	4.90[***]	.50[***]	−.05	.20[***]	.01[*]	.01[***]
Ag	22.15[**]	6	.99	.98	.05	.03, .08	5.10[***]	.49[***]	.02	.26[***]	.02[*]	.01[***]
Co	22.02[**]	6	.99	.99	.05	.03, .08	4.17[***]	.67[***]	−.06[*]	.19[***]	.01[*]	.01[*]
ES	23.43[***]	6	.99	.98	.06	.03, .08	4.61[***]	.71[***]	−.05	.37[***]	.02[*]	.02[***]
Op	27.62[***]	6	.99	.98	.06	.04, .09	4.43[***]	.58[***]	.04	.24[***]	.01	.01[***]

Note: Ex, Extraversion; Ag, Agreeableness; Co, Conscientiousness; ES, Emotional Stability; Op, Openness; σ^2, Variance around the means.
[*]$p < .05$; [**]$p < .01$; [***]$p < .001$.

Latent class growth analysis

LCGA is aimed at finding the smallest number of classes capturing most variance among individuals with regard to initial levels and change on variables included in the model. Because univariate LGMs indicated that personality development had a curvilinear shape, we specified linear as well as quadratic slopes in the LCGAs. In LCGAs, variances of the estimated means of intercepts and linear as well as quadratic growth terms are constrained to zero. When compared to related procedures in which variances of intercepts and slopes are freely estimated (e.g. Growth Mixture Modelling; Muthén & Muthén, 2000), LCGA results in a somewhat less optimal model fit, but produces more clearly distinguishable classes (Nagin, 2005).

We used several criteria, outlined by Muthén and Muthén (2000), to determine the number of latent classes (i.e. developmental personality types) that best characterized our data. First, we used the Sample Size Adjusted Bayesian Information Criterion (SSA-BIC; e.g. Schwarz, 1978) and the Lo–Mendell–Rubin Likelihood Ratio Test (LMR-LRT; Lo, Mendell, & Rubin, 2001). The optimal model has the lowest SSA-BIC, while a significant LMR-LRT indicates that a model with k classes is better than a model with $k-1$ classes.

Table 3. Fit indices of various LCGA solutions

	SSA-BIC	Entropy	LMR-LRT
One class	67964.01	—	—
Two classes	65975.05	.82	2028.82[*]
Three classes	63939.63	.87	1853.30[**]
Four classes	63119.46	.88	870.63[**]
Five classes	62574.09	.88	598.32

[*]$p < .05$; [**]$p < .01$. An insignificant LMR-LRT indicates that a solution with k classes is not significantly better than a solution with $k-1$ classes. In a one-class solution, it is impossible to calculate the Entropy and run an LMR-LRT test.

Second, we assessed the index of classification accuracy: The entropy. The entropy can range from .00 to 1.00, with higher figures representing a more accurate classification (Hix-Small, Duncan, Duncan, & Okut, 2004). Third, theoretical meaningfulness of classes in the various solutions was considered. If a class found in a solution with k classes was found to be a slight variation of a class already found in a solution with $k-1$ classes, the most parsimonious solution was chosen (Muthén & Muthén, 2000).

   With this approach, a three-class solution proved to be better than a two-class solution. Adding a fourth class did improve model fit, but adding a fifth class did not result in an improvement of model fit (see Table 3). In addition, the fourth class in the four-class solution proved to be a slight variation of one of the classes that was already present in the three-class solution. More specifically, this fourth class represented Resilients with lower

Table 4. Mean intercepts and growth factors

	Resilients	Undercontrollers	Overcontrollers
	M (95% C.I.)	*M* (95% C.I.)	*M* (95% C.I.)
Intercepts			
Ex	5.43[***,a] (5.33, 5.54)	5.07[***,b] (4.88, 5.26)	4.34[***,c] (4.23, 4.46)
Ag	5.51[***,a] (5.38, 5.64)	4.41[***,b] (4.10, 4.72)	5.17[***,c] (5.07, 5.28)
Co	4.35[***,a] (4.15, 4.56)	3.63[***,b] (3.42, 3.85)	4.34[***,a] (4.22, 4.46)
ES	4.88[***,a] (4.74, 5.02)	5.03[***,a] (4.82, 5.25)	4.10[***,b] (3.97, 4.23)
Op	4.80[***,a] (4.63, 4.96)	3.63[***,b] (3.35, 3.90)	4.62[***,a] (4.51, 4.74)
Linear slopes			
Ex	.16[**,a] (.06, .26)	.00[a] (−.13, .14)	−.24[***,b] (−.34, −.15)
Ag	.17[***,a] (.09, .25)	−.03[a,b] (−.23, .16)	−.06[b] (−.15, .03)
Co	−.04[a] (−.14, .06)	−.08[a] (−.23, .07)	−.02[a] (−.11, .07)
ES	.07[a] (−.06, .19)	−.02[b] (−.21, .16)	−.18[**,b] (−.29, −.07)
Op	.22[***,a] (.13, .31)	−.12[b] (−.30, .06)	.01[b] (−.08, .10)
Quadratic slopes			
Ex	−.02[*,a] (−.05, .00)	.01[a,b] (−.02, .04)	.05[***,b] (.03, .07)
Ag	−.02[**,a] (−.04, −.01)	.05[*,b] (.00, .09)	.03[**,b] (.01, .05)
Co	.00[a] (−.14, .06)	.03[a] (.00, .06)	.00[a] (−.02, .02)
ES	−.01[a] (−.06, .19)	.01[a,b] (−.03, .05)	.04[***,b] (.02, .07)
Op	−.03[**,a] (−.05, −.01)	.05[*,b] (.01, .09)	.01[a,b] (−.01, .02)

Note: Ex, Extraversion; Ag, Agreeableness; Co, Conscientiousness; ES, Emotional Stability; Op, Openness. Within a row, different superscripts indicate significant differences ($p < .05$) between Resilients, Undercontrollers and Overcontrollers in extraversion, agreeableness, conscientiousness, emotional stability and openness. Significance of differences between personality types on Big Five dimensions were obtained by comparing 95% confidence intervals of intercept and slope factors. These 95% confidence intervals are displayed between brackets. Effect sizes (Cohen's *d*'s) of significant between-group differences in intercepts and slope factors range from .43 to 2.17.
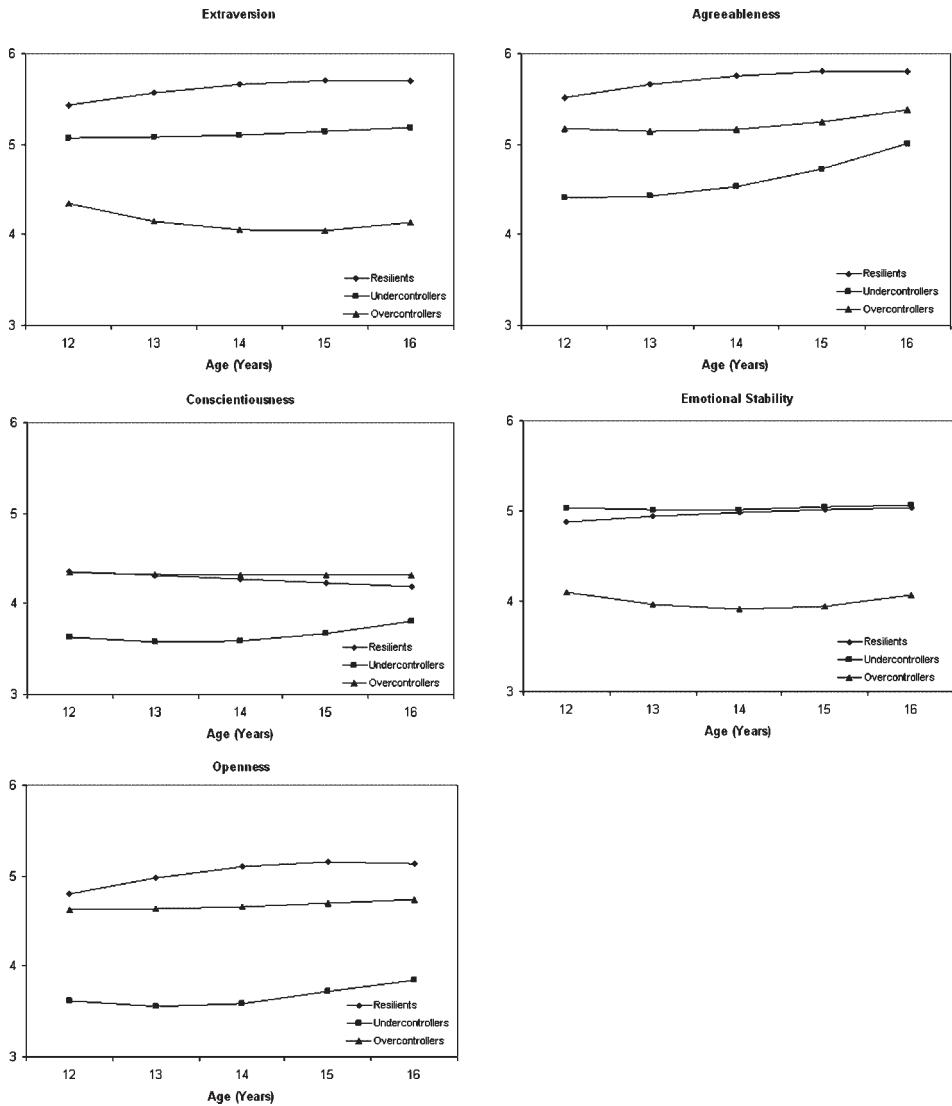
Figure 1.   Estimated growth of personality in Resilients, Undercontrollers and Overcontrollers for extraversion, agreeableness, conscientiousness, emotional stability and openness, respectively.

scores on conscientiousness, and slightly lower scores on agreeableness. Because of this, we chose the three-class solution as our final solution.

In line with our expectations, the three classes we found could be described as Resilients (33.9% of the sample, $n = 313$), Undercontrollers (24.7% of the sample, $n = 228$) and Overcontrollers (41.4% of the sample, $n = 382$). Means and variances of growth parameters for the three types are displayed in Table 4, and are plotted in Figure 1.

Confidence intervals revealed that Resilients had the highest intercepts on four of the Big Five dimensions. For emotional stability, the intercepts of Undercontrollers were somewhat higher than those of Resilients, but these differences did not reach significance.

Overcontrollers had equally high intercepts as Resilients for openness and conscientiousness. Undercontrollers had intermediate intercepts on extraversion, and the lowest intercepts for agreeableness, conscientiousness and openness. Overcontrollers had intermediate intercepts for agreeableness and the lowest intercepts for emotional stability and extraversion.

As personality development in Resilients, Undercontrollers and Overcontrollers was characterized by curvilinear growth, which is a function of both linear and quadratic slope parameters (displayed in Table 4), it is hard to judge differences in growth from a table. Therefore, growth of the personality types for each Big Five trait is displayed in Figure 1.

Figure 1 shows that levels of extraversion increased for Resilients, were stable for Undercontrollers and decreased in Overcontrollers. Levels of agreeableness increased for all three types. With regard to conscientiousness, change rates did not reach significance. Levels of emotional stability did not change significantly for Resilients and Under-controllers. Overcontrollers displayed a curvilinear pattern of change, in which a decrease in emotional stability was followed by an increase. Resilients and Undercontrollers became more open to experience as they grew older, whereas Overcontrollers' levels of openness were stable across the period covered in the current study.

Substantial gender differences in the prevalence of the three personality types were found (χ^2 (2) = 42.04; $p < .001$). Boys were relatively more often classified as Undercontrollers than girls (33.8 and 15.4%, respectively; χ^2 (1) = 41.88; $p < .001$), but less often classified as Resilients (29.3 and 38.7%, respectively; χ^2 (1) = 9.11; $p = .003$) and Overcontrollers (37.0 and 45.9%, respectively; χ^2 (1) = 7.65; $p = .006$).

Developmental personality types and problem behaviour

To further validate our developmental typology, we assessed whether Resilients, Undercontrollers and Overcontrollers were described by distinct initial levels (i.e. intercepts) and change rates (i.e. slopes) of problem behaviour (i.e. depression and delinquency). For this purpose, we used multigroup LGMs, with the personality types as groups. Descriptive statistics of depression and delinquency are provided in Table 1.

Development of both depression and delinquency was best described by curvilinear growth. Fits of the models for both depression (χ^2 (21) = 20.24 (n.s.); CFI = 1.00;

Table 5. Mean intercepts and growth factors of problem behavior

	Resilients	Undercontrollers	Overcontrollers
Intercepts			
Depression	1.11[***,a] (1.09, 1.13)	1.14[***,a] (1.11, 1.17)	1.22[***,b] (1.19, 1.24)
Delinquency	1.12[***,a] (1.09, 1.14)	1.27[***,b] (1.20, 1.33)	1.14[***,a] (1.11, 1.17)
Linear slopes			
Depression	.01[a] (−.01, .03)	.03[*,a] (.00, .06)	.03[a] (.00, .05)
Delinquency	.00[a] (−.02, .03)	−.05[a] (−.10, .00)	−.03[*,a] (−.06, −.01)
Quadratic slopes			
Depression	.00[a] (.00, .00)	−.01[**,a] (−.02, .00)	.00[a] (−.01, .00)
Delinquency	.00[a] (.00, .01)	.01[a] (.00, .02)	.01[**,a] (.00, .01)

*$p < .05$; **$p < .01$; ***$p < .001$. Within a row, different superscripts indicate significant differences ($p < .05$) between Resilients, Undercontrollers and Overcontrollers in depression and delinquency. Significance of differences between personality types on Big Five dimensions were obtained by comparing 95% confidence intervals of intercept and slope factors. These 95% confidence intervals are displayed between brackets. Effect sizes (Cohen's d's) of significant between-group differences in intercepts and slope factors range from .59 to .61.
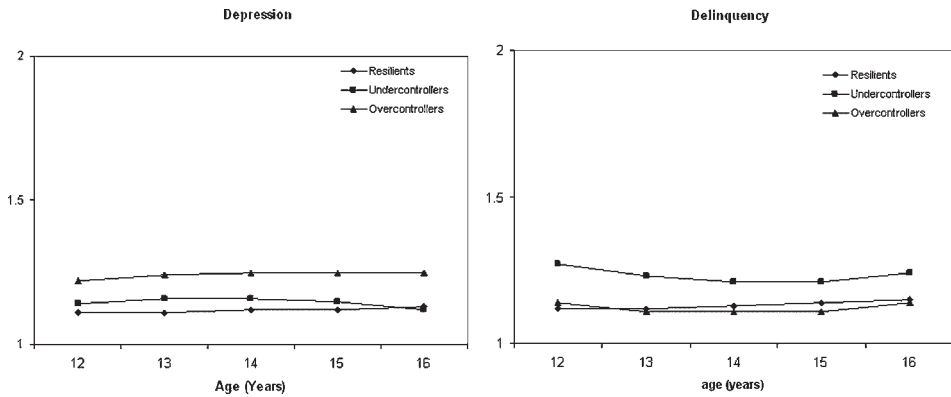
Figure 2.   Estimated growth of depression and delinquency in Resilients, Undercontrollers and Overcontrollers.

TLI = 1.00; RMSEA = .00 (90% C.I. = .00, .05)) and delinquency (χ^2 (21) = 49.31 ($p < .001$); CFI = .98; TLI = .97; RMSEA = 0.07 (90% C.I. = .04, .09)) were good. Initial levels and growth of depression and delinquency are shown in Table 5 and displayed in Figure 2.

Confidence intervals revealed that Resilients had the lowest initial levels of both depression and delinquency. Overcontrollers had the highest initial levels of depression, and Undercontrollers were characterized by the highest levels of delinquency. Undercontrollers displayed a curvilinear change pattern for depression, which resulted in little change across time. Resilients and Overcontrollers did not change significantly with regard to depression. For delinquency, Overcontrollers displayed a significant curvilinear growth pattern that resulted in very little change over time. Resilients and Undercontrollers did not exhibit significant changes in delinquency.

DISCUSSION

The purpose of this study was to examine a developmental typology of adolescent personality. The current study was the first with an exclusive focus on a developmental personality typology of adolescence, applying the recently developed LCGA framework (LCGA; Nagin, 1999, 2005).

We decided to label the three classes we found with LCGA as Resilients, Undercontrollers and Overcontrollers, because their Big Five profiles were comparable to the profiles typically found in previous studies that applied cross-sectional clustering techniques to identify these personality types (e.g. Akse et al., 2007; Dubas et al., 2002; Robins et al., 1996). Like in these previous studies, Resilients had the most favourable personality profile with high scores on all Big Five traits, Undercontrollers scored low on agreeableness, conscientiousness and openness and Overcontrollers displayed low levels of extraversion and emotional stability. In addition, the longitudinal personality types we found in the current study were related to problem behaviour in a similar way as personality types found in the just mentioned cross-sectional studies. Thus, Resilients had low levels of problem behaviour, Undercontrollers were characterized by high levels of externalizing behaviour (i.e. delinquency) and Overcontrollers had high levels of internalizing problem

behaviour (i.e. depression). Our developmental personality typology was also similar to other developmental typologies from adolescence into adulthood, as these typologies also included types comparable to Resilients, Undercontrollers and Overcontrollers (Block, 1971; Morizot & Le Blanc, 2003, 2005).

Almost four decades ago, Block (1971) made a case for incorporating normative developmental trends in personality typologies. Our results demonstrated that although the three types we found remain clearly distinguishable from one another from early to middle adolescence, they manifested themselves in slightly different ways across time. In other words, they displayed distinct patterns of normative development. These different developmental trajectories of the developmental types will now be discussed, trait-by-trait.

For conscientiousness and emotional stability, all three types displayed a similar developmental trajectory with very little change across time. On these traits, differences between types were therefore present in a fairly consistent way from early to middle adolescence. With regard to openness and extraversion, differences between Overcontrollers and Resilients became larger across time. Openness has been shown to be positively related to success in job interviews (Caldwell & Burger, 1998) and training proficiency (Salgado, 1997), while extraversion has been related to occupational success once a job has been attained (Roberts, 1997). As such, our Overcontrollers seem to have moved towards a position that is at least somewhat less advantageous with regard to entering the labour market. However, the current study only focused on developmental trajectories of personality in early to middle adolescence. Future studies should investigate whether Overcontrollers regain a more advantageous position in late adolescence.

We found increases in agreeableness for Resilients, Undercontrollers and Overcontrollers. The fact that Undercontrollers displayed increases while they initially had low scores on this trait might suggest that they outgrow their deficit. However, because Resilients and Overcontrollers also became more agreeable as they grow older, Undercontrollers retained their relatively disadvantageous position with regard to this trait when compared to Resilient and Overcontrollers. Our findings therefore suggest that Undercontrollers manifested themselves in somewhat different ways across adolescence as a function of normative development (i.e. changes that occur to a similar extent in most individuals in a sample; e.g. Roberts & DelVecchio, 2000). Thereby, our results support Block's (1971) view that it is important to take normative development into account when studying developmental change in personality types, because mean-level changes do not necessarily indicate that one exhibits favourable changes in personality relative to others. Finally, there were no significant differences between types with regard to change rates of problem behaviour. As such, Overcontrollers still displayed the highest levels of depression, and Undercontrollers still had the highest levels of delinquency by middle adolescence. This is in line with studies that identified personality types cross-sectionally (e.g. Akse et al., 2004; Asendorpf, 2003; Denissen et al., 2008; Hart et al., 2003; Robins et al., 1996).

Generally, adolescents exhibited only a limited amount of mean-level change. This might seem to contradict the general conception of adolescence as a period of 'storm-and-stress' (e.g. Arnett, 1999), and hence of rapid changes. However, a meta-analysis by Roberts, Walton and Viechtbauer (2006) also revealed a limited amount of change in personality among adolescents. In line with these findings, Arnett (1999) previously concluded that adolescence only is a period of 'storm-and-stress' for a minority of youth.

As such, it is perhaps not too surprising that there generally only was a limited amount of mean-level change in personality traits.

The just mentioned studies that identified personality types cross-sectionally, consistently found that Resilients were the most prevalent. The present study had different results, as Overcontrollers were the most prevalent. The most likely reason of why we found more Overcontrollers than Resilients is related to the longitudinal methodology we applied to derive types. Using multiple measurement occasions to derive types is fundamentally different from using just one measurement occasion and can therefore yield different results. In fact, a previous study using a longitudinal typology (Block, 1971) also classified more individuals in types comparable to Overcontrollers, than in types comparable to Resilients.

There were remarkable gender differences in the prevalence of developmental personality types. These gender differences were comparable to those previously demonstrated in studies using cross-sectional methodology to derive personality types (e.g. Dubas et al., 2002), as our results demonstrate that boys were more likely to be Undercontrollers and less likely to be Overcontrollers and Resilients. The latter finding, indicating that girls were more likely to be Resilients, suggests that the girls in our sample were more adjusted than the boys with regard to their personality profile.

Limitations

Although the current study presents one of the few attempts to revive Block's (1971) search for a developmental typology of personality, some limitations need to be recognized.

First, the focus of the current study was restricted to early to middle adolescence. Although cross-sectionally derived Resilients, Undercontrollers and Overcontrollers have been found in samples including children, adolescents and adults (Asendorpf et al., 2001), it is not clear to what extent our developmental types are replicable in samples representing children or adults.

A second, but related, issue is that the current study only follows participants for a limited period of time (i.e. early to middle adolescence). It would be interesting to investigate developmental trajectories from adolescence into adulthood, like Block (1971) and Morizot and LeBlanc (2003, 2005) did. However, those studies applied less advanced statistical techniques and less frequent measurements, and employed smaller samples than the current study. Combining the strengths of our study and their studies would allow for an examination of a reliable developmental typological approach to life span personality development.

Third, the types we found in the current study mainly differ in levels of personality traits and much less in changes of these levels. In addition, it should be noted that the boundaries between personality types, which are thus most visible in the distinct levels they display, are fuzzy. Therefore, these types cannot be regarded as perfectly distinct entities (Asendorpf et al., 2001), but should instead be regarded as an attempt to explore the patterns of heterogeneity that tend to exist in personality development at the population level (Johnson et al., 2007).

A fourth limitation refers to our use of LCGA. This technique assigns individuals to classes based on their intercepts (i.e. initial levels) and slopes (i.e. change rates) (Nagin, 1999). LCGA does not necessarily assign more relative weight to one of the two, but uses variances around intercepts and growth factors to identify different developmental trajectories. In the current study, there was more variance around mean intercepts than

around mean slopes. As a result, it should be noted that the impact of inter-individual differences in intercepts might have been larger than the impact of inter-individual differences in slopes in the classification of individuals in the several classes.

Finally, we only used adolescent self-reports to assess personality traits. The validity of self-reports could be limited due to social desirability. In addition, reported changes in personality might represent changes in the beliefs adolescents have about themselves (Robins, Fraley, Roberts, & Trzesniewski, 2001). However, Robins, Noftle, Trzesniewski and Roberts (2005) demonstrated that the beliefs young adults had about the way they changed, were quite accurate. The self-reports we used should provide a reliable estimate of personality of early adolescents, because Soto, John, Gosling and Potter (2008) demonstrated that self-reports already provided an accurate estimate of personality at age ten, and that the psychometrics of the Big Five did not change as adolescents grew older. As such, we believe that our use of adolescent self-reports is an appropriate method to assess adolescent personality change.

CONCLUSION

Despite these potential limitations, the current study provides valuable insights into adolescent personality development. More specifically, we replicated the three adolescent personality types typically found in studies using cross-sectional methodology as developmental personality types. Resilients, Undercontrollers and Overcontrollers exhibited different developmental trajectories, but remained clearly distinguishable from one another across time.

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