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Personality Types in Adolescence: Change and Stability and Links With Adjustment and Relationships: A Five-Wave Longitudinal Study

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We examined change and stability of the 3 personality types identified by Block and Block (1980) and studied their links with adjustment and relationships. We used data from a 5-wave study of 923 early-to-middle and 390 middle-to-late adolescents, thereby covering the ages of 12–20 years. In Study 1, systematic evidence for personality change was found, in that the number of overcontrollers and undercontrollers decreased, whereas the number of resilients increased. Undercontrol, in particular, was found to peak in early-to-middle adolescence. We also found substantial stability of personality types, because 73.5% of the adolescents had the same personality type across the 5 waves. Personality change was mainly characterized by 2 transitions: overcontrol → resiliency and undercontrol → resiliency. The transitional analyses implied that the resilient type serves more often as the end point of personality development in adolescence than do overcontrol and undercontrol. Analyses of the personality type trajectories also revealed that the majority of adolescents who change personality type across 5 years made only 1 transition. Study 2 revealed systematic differences between resilients and overcontrollers in anxiety. Stable resilients were less anxious over time than were stable overcontrollers. Further, change from overcontrol to the resilient type was accompanied by decreases in anxiety, whereas change from the resilient type to overcontrol was accompanied by an increase in anxiety. Similarly, systematic differences between personality types were found in the formation of intimate relationships.

Keywords: personality development, adolescence, latent transition analysis, personality and adjustment, personality and intimate relationships

Two commonly held assumptions of research into personality development are that personality has "set like plaster" (James, as cited in Costa & McCrae, 1994, p. 21) and will not change much after the age of 30 and that adolescence is a period in which personality matures and becomes more stable. Recently, four indices have been used to tap change and stability of personality. Two of these, mean-level change and rank-order stability, are variable-centered and use personality traits to assess change and stability of personality. Two other indices, profile stability and personality types, are person-centered and tap the intraindividual configuration of personality.

As evidenced by recent meta-analyses, most research has examined mean-level change and rank-order stability. The index of mean-level change assesses whether personality traits mature over time; that is, whether individuals show increases in extraversion, agreeableness, conscientiousness, emotional stability, and openness when they get older. Rank-order stability taps whether the rank order of individuals on traits is maintained over time. The meta-analysis by Roberts, Walton, and Viechtbauer (2006) revealed systematic mean-level growth of extraversion, emotional stability, and openness in adolescence. Similarly, the meta-analysis by Roberts and DelVecchio (2000) and recent studies by Klimstra, Hale, Raaijmakers, Branje, and Meeus (2009) and Pullmann, Raudsepp, and Allik (2006) showed that rank-order stability of personality traits increases as adolescents get older. Thus, both trait indices have shown personality maturation in adolescence.

Person-centered research into the development of personality in adolescence is relatively scarce. We consider this to be an omission, because studying the "dynamic organization within the individual" (Allport, 1937, p. 48) is key to understanding (adolescent) personality. Until now, only one large-scale longitudinal study has used the third index and assessed the growth of profile stability in adolescence. Profile stability gives information on the stability of a constellation of traits over time and is usually calculated using *q* correlations. A higher *q* correlation indicates a more stable configuration of traits within a person. A more stable configuration indexes the level of formal organization of a person's personality profile and is therefore an indicator of maturity (Roberts, Caspi, & Moffitt, 2001). In an earlier report of the data used in the present study, Klimstra et al. (2009) found a linear increase of profile

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stability between the ages of 12 and 20 years, indicating systematic maturation of personality organization in adolescence.

Similarly, research using the fourth index, adolescent personality types, is also scarce and covers a limited time span. In contradistinction to profile stability, personality types are not indices of a formal level of personality organization but rather are typical configurations of high and low scores on relevant personality traits. Therefore, the first aim of the present article is to provide a systematic account of stability and change of personality types in adolescents of ages 12–20. Does this change have a direction? Is there more movement into certain personality types than into others? Study 1 attempts to answer to these questions. In Study 2, we scrutinize how these changes are linked to the development of anxiety and relationships in adolescence. Because the concrete research questions of Study 2 are dependent on the findings of Study 1, we present them after the results of this study.

Study 1

Three Personality Types

Many studies on personality distinguish three types: resilients, overcontrollers, and undercontrollers. This typology is based on the theory of ego-control and ego-resiliency by Block and Block (1980). In their dimensional personality theory, *ego-control* has been defined as the tendency to contain versus express motivational impulses, and *ego-resiliency* as the tendency to respond flexibly to environmental demands. Caspi (1998) and Asendorpf, Borkenau, Ostendorf, and van Aken (2001) suggested that the three personality types could be constructed as specific combinations of ego-control and ego-resiliency: Resilients are characterized by high levels of ego-resiliency and moderate levels of ego-control and are able to adapt their levels of ego-control to environmental demands. Overcontrollers and undercontrollers have low levels of ego-resiliency and differ markedly on ego-control. Overcontrollers maintain relatively inflexible levels of high ego-control, whereas undercontrollers have relatively inflexible levels of low ego-control.

In the last 15 years, numerous studies have documented the three personality types in children (Asendorpf et al., 2001; Asendorpf & van Aken, 1999; De Fruyt, Mervielde, & Van Leeuwen, 2002; Dennissen, Asendorpf, & van Aken, 2008; Hart, Atkins, & Fegley, 2003; Hart, Hoffman, Edelstein, & Keller, 1997), adolescents (Akse, Hale, Engels, Raaijmakers, & Meeus, 2004; Akse, Hale, Engels, Raaijmakers, & Meeus, 2007a, 2007b; Boehm, Asendorpf, & Avia, 2002; De Fruyt et al., 2002; Dubas, Gerris, Janssens, & Vermulst, 2002; Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2010; Robins, John, Caspi, Moffitt, & Stouthamer-Loeber, 1996; Scholte, Van Lieshout, De Wit, & van Aken, 2005; van Aken, & Dubas, 2004), and adults (Asendorpf et al., 2001; Barbaranelli, 2002; Schnabel, Asendorpf, & Ostendorf, 2002). The various studies used *Q* factor analysis or cluster analysis to derive the personality types from data collected in various countries, including Belgium, Italy, Finland, Germany, the Netherlands, Spain, and the United States. A couple of studies did not find the three types. Boehm et al. (2002), for example, found replicability of the types to be low in Spanish adults, and McCrae, Terraciano, Costa, and Ozer (2006) found only two replicable types in U.S. adults.

Until now, a limited number of studies have addressed longitudinal change of personality types in adolescence. The existing research has used two- or three-wave annual designs only and, consequently, covered a limited time span. The first aim of the present article is therefore to present a systematic account of personality change during adolescence. We use a five-wave longitudinal data set to study personality change from early to late adolescence (ages 12–20).

Longitudinal Studies Examining Stability and Change of Personality Types

Three studies have reported on stability and change of personality types in adolescence. Akse et al. (2007b) found 1-year stabilities of 58.6% for resilients, 62.7% for overcontrollers, and 51.3% for undercontrollers. Asendorpf et al. (2001) found 6-month stability of .61 (Cohen's κ) across types, and van Aken and Dubas (2004) reported 38% stability across 2 years. These findings suggest that personality types are relatively unstable in adolescence, which raises the question of whether there are increases and decreases in the relative prevalence of personality types. Unfortunately, none of the aforementioned studies have explicitly examined this intriguing issue.

The low stability of personality types in adolescence and the lack of information on increase and decrease of personality types suggest the following research question: Does change of personality types have a direction characterized by an increase of some types and a decrease of other types over time? If so, which transitions between the types (e.g., the transition from the overcontrolled to the resilient type) carry this systematic change? Theoretically and empirically, we can formulate two hypotheses. The first hypothesis suggests systematic movement into the direction of resiliency. This hypothesis is based upon the Big Five profiles of the three types. Typically, resilients have high scores on all traits (extraversion, agreeableness, conscientiousness, emotional stability, and openness), overcontrollers score high on agreeableness and conscientiousness but low on emotional stability, and undercontrollers score high on extraversion but low on agreeableness and conscientiousness (Asendorpf et al., 2001; De Fruyt et al., 2002; Robins et al., 1996). The meta-analysis by Roberts et al. (2006) revealed systematic mean-level growth of social vitality (a facet of extraversion) in late adolescence (ages 18–22), social dominance (another facet of extraversion) in early-to-late adolescence (ages 10–18) and late adolescence, emotional stability in early-to-late and late adolescence, and openness in late adolescence. In terms of personality types, these changes would entail a shift in the direction of the type that has generally higher levels of extraversion, emotional stability, and openness, namely resilients. The second hypothesis is based upon the notion that the three personality types constitute more or less fuzzy sets of personality characteristics. In other words, they overlap with one another to some extent (Asendorpf et al., 2001; Hart et al., 2003; Morizot & Le Blanc, 2005). Asendorpf and van Aken (1999), however, showed that overcontrollers and undercontrollers are more discrete from one another than are both types from resilients. Specifically, stronger negative correlations existed between the prototypes of over- and undercontrollers than did between either of these prototypes and resilients (see also Block & Block, 1980, p. 68). This suggests that the distance between overcontrollers and undercon-

trollers is greater than the distance from these types to resilients. Consequently, higher probabilities over time would be expected for transitions from overcontrollers and undercontrollers to resilients, and vice-versa, than for transitions from over- to undercontrollers or the reverse.

Hypotheses and Exploratory Research Questions

The primary goal of Study 1 was to evaluate whether personality types are stable or whether there is a systematic personality change in the direction of resiliency during adolescence. To meet this goal, we tested three hypotheses and studied two exploratory research questions. Hypothesis 1.1 addressed increases and decreases of personality types, as well as transitions between types. We expected, on the basis of earlier research into mean-level change of personality traits, an increase of resilients (R) and a decrease of overcontrollers (O) and undercontrollers (U). We expected the increase of resilients to be carried by the transitions O→R and U→R, with the prevalence of these transitions being greater than the reversed ones, R→O and R→U. Hypothesis 1.2 addressed differences in transitions between personality types. Specifically, are the transition probabilities of O→R, R→O, U→R, and R→U higher than those of O→U and U→O? Given earlier findings that overcontrollers and undercontrollers are more discrete types than are overcontrollers and resilients or undercontrollers and resilients, we expected transition probabilities of O→R, R→O, U→R, and R→U to be higher than those of O→U and U→O. Exploratory Research Question 1.1 addressed differences in the prevalence of personality types across time between early-to-middle and middle-to-late adolescents. Exploratory Research Question 1.2 studied age group differences in stability and change of personality types. Finally, Hypothesis 1.3 addressed gender differences in prevalence, stability, and change of personality types. We expected to replicate the established finding that male adolescents are more often undercontrollers and female adolescents are more often overcontrollers. These issues were examined using data from a five-wave study, including an early-to-middle adolescent cohort and a middle-to-late adolescent cohort, thereby covering the ages from 12 to 20 years.

Method

Participants. Data for this study were collected as part of the ongoing Dutch research project CONflict And Management Of RElationships (CONAMORE; Meeus et al., 2006), with a 1-year interval between each of the five available waves. The longitudinal sample consisted of 1,313 participants, divided into an early-to-middle adolescent cohort (n = 923; 70.3%), who were 12.4 years of age (SD = 0.59) on average at baseline, and a middle-to-late adolescent cohort (n = 390; 29.7%) with an average age of 16.7 years (SD = 0.80) at baseline. Because both age groups were assessed during five measurement waves, a total age range from 12 to 20 years was available. The early-to-middle adolescent cohort consisted of 468 boys (50.7%) and 455 girls (49.3%), and the middle-to-late adolescent cohort consisted of 169 boys (43.3%) and 221 girls (56.7%). In both the younger and older cohorts, the vast majority of adolescents (85.1% and 84.3%, respectively) indicated that they were living with both their parents. The remainder of adolescents lived with their mothers (7.9% and 7.2% in the younger and older cohort, respectively) or elsewhere (e.g., with their fathers, with one biological parent and one stepparent, or with other family members). The composition of the two cohorts did not significantly differ with regard to ethnicity. In the younger cohort, 83.4% identified themselves as Dutch, and 16.6% indicated that they belonged to ethnic minorities (e.g., Surinamese, Antillean, Moroccan, Turkish). In the older cohort, 87.4% of participants were Dutch, and 12.6% were ethnic minorities. In the year when the current study was initiated (2001), 21% of all early-to-middle adolescents and 22% of all middle-to-late adolescents in the Netherlands belonged to ethnic minority groups (Statistics Netherlands, 2008a). Thus, ethnic minorities were slightly underrepresented in our sample. With regard to education, all participants initially were in junior high and high schools. Given the Dutch educational system, most participants switched schools at least once during the study. Specifically, participants in the younger cohort switched from junior high school to high school, whereas 31% of the participants in the older cohort switched from high school to college/university and 69% switched to various other forms of continuing education. Because of the sample recruitment procedure, 100% of our middle-to-late adolescents were in high school or college, whereas national demographic statistics (Statistics Netherlands, 2008a, 2008b, 2008c) reveal that 96% of the Dutch middle-to-late adolescents were in some form of education and 22.5% were in university during the period covered by the current study (i.e., 2001–2005). For this reason, and also because the sample was recruited solely from the province of Utrecht, it cannot be considered to be fully representative of the Dutch population.

Sample attrition was 1.2% across waves: In Waves 1, 2, 3, 4, and 5 the number of participants was 1,313, 1,313, 1,293, 1,292, and 1,275, respectively. We were able to keep attrition low by using a group of interviewers who collected data from the adolescents when they were at home rather than at school at the time of the annual measurement. Missing values of the measures of Study 1 and Study 2 were estimated in SPSS, using the expectation maximization procedure. Little's (1988) Missing Completely at Random test produced a normed chi-square (χ^2/df) of 1.55, which, according to Bollen (1989), indicates that the data were likely missing at random and that it is safe to impute missing values.

Procedure. Participating adolescents were recruited from various high schools in the province of Utrecht, the Netherlands. Participants and their parents received an invitation letter describing the research project and goals and inviting them to participate. More than 99% of the families who were approached signed the informed consent form. During regular annual assessments, participating adolescents completed questionnaires at school or at home. Confidentiality of responses was guaranteed. Adolescents received €10 (approximately US$13) for each wave in which they provided data.

Measures.

Personality. Personality was assessed with a shortened, 30-item Dutch version of Goldberg's (1992) Big Five questionnaire (Gerris et al., 1998). This instrument uses a 7-point Likert scale, with a response format ranging from 1 (*completely untrue*) to 7 (*completely true*), to assess five personality dimensions: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to Experience. All dimensions are measured with six items each—items measuring qualities such as being talkative (Extraversion), sympathetic (Agreeableness), systematic (Consci-

entiousness), worried (Emotional Stability, reversed-scored), and creative (Openness to Experience). Previous studies (e.g., Branje, Van Lieshout, & van Aken, 2004; De Fruyt et al., 2006; Dubas et al., 2002; Scholte et al., 2005) have demonstrated that this measure provides a valid and reliable estimate of adolescent Big Five personality traits. In the current study, reliability was high across waves, because the ranges of internal consistency coefficients (Cronbach's alphas) for each Big Five trait in early-to-middle adolescents were as follows: Extraversion (.76–.85), Agreeableness (.80–.88), Conscientiousness (.81–.88), Emotional Stability (.81–.84), and Openness to Experience (.76–.78). For middle-to-late adolescents, these figures were as follows: Extraversion (.86–.91), Agreeableness (.81–.88), Conscientiousness (.87–.92), Emotional Stability (.79–.85), and Openness to Experience (.74–.79).

Analytic strategy. To address our research questions, we used two applications of the general latent class model: latent class analysis (LCA) and latent transition analysis (LTA). LCA is a person-centered analytic strategy that is a confirmatory version of cluster analysis. LCA groups individuals into classes on the basis of empirically distinct patterns of scores on the variables used to create the classes (in this case, the Big Five traits). The LCA of continuous variables is sometimes referred to as latent profile analysis. For simplicity, we use the term LCA here. Like confirmatory factor analysis, LCA generates both measurement and structural parameters (Nylund, Asparouhov, & Muthén, 2007). The continuous scores for each of the Big Five traits within each class represent the measurement parameters, whereas the structural parameters refer to the class membership probabilities assigned to groups of individuals. Unlike cluster analysis, LCA offers fit statistics and significance tests to determine number of classes and assigns class membership on the basis of class probabilities, thereby taking uncertainty of membership, or error, into account. LCA has been found to be superior to cluster analysis in several Monte Carlo studies (e.g., Reinke, Herman, Petras, & Ialongo, 2008). In the present study, we applied LCA to test whether the three hypothesized personality types would emerge in each of the five measurement waves.

LTA represents a longitudinal extension of LCA (for a recent overview of LTA, see Kaplan, 2008). LTA calculates patterns of stability and change over time in the form of movement or transitions between classes (in this case, personality types). Like LCA models, LTA models use class-specific parameters (the continuous scores for each of the Big Five traits within each class) as measurement parameters and use class probabilities as structural parameters to estimate the number of participants in each of the classes. To model change over time, LTA adds a second set of structural parameters, latent transition probabilities, to the latent class model. In a two-wave LTA, for example, transition probabilities refer to the probability of moving into class Y in Wave 2, conditional on having been in class X in Wave 1. These transition probabilities range between 0 and 1. In sum, then, LTA offers the following two types of structural parameters: (a) varying numbers of participants in a class across waves, indicating increase or decrease in class size over time, and (b) transitions of individuals between classes that carry these changes of class size. LTA is therefore appropriate for evaluating the hypothesized increase of resilients and decrease of overcontrollers and undercontrollers, as well as the hypothesized personality type transitions that carry these increases or decreases over time.

LTA results can be converted into contingency tables that summarize the prevalence of classes (personality types) across waves. We use Bayesian model selection with (in)equality constraints between the parameters of interest (Klugkist, Laudy, & Hoijtink, 2005) to evaluate these contingency tables. For a more detailed description of this method, readers are referred to Hoijtink, Klugkist, and Boelen (2008), and for application of this method to contingency tables, to Laudy and Hoijtink (2007). Using constraints may express prior information explicitly. In this manner, one can evaluate the likelihood of certain patterns of increases and decreases of personality types. Moreover, one can evaluate differences in prevalence, transitions, and change and stability of personality types between early-to-middle and middle-to-late adolescents.

The results of the Bayesian model selection are expressed in terms of Bayes factors (BFs), representing the amount of evidence in favor of the model at hand compared with another model, and posterior model probabilities (PMPs), representing the probability that the model at hand is the best among a set of finite models after observing the data. PMPs of a model are computed by dividing its BF by the sum of all BFs.

Results

Change and stability of personality in adolescence. We present our results in four steps. First, we apply cross-sectional LCA to explore the number of classes (personality types) within each of the five waves. Second, we select the best fitting five-wave LTA model in a number of successive steps. Because we wanted to compare the prevalence of personality types between the early-to-middle and middle-to-late cohorts, we assumed measurement invariance across cohorts by restricting the profiles of the three personality types on the Big Five traits to be the same across cohorts. Third, we apply Bayesian evaluations of the contingency tables generated by the final LTA model. The LTA models were used to test our three hypotheses and to find general answers to our two exploratory research questions. The Bayesian evaluations are intended as follow-up analyses to detail the findings of the final LTA model in testing Hypotheses 1.1 and 1.2 and in answering Exploratory Research Questions 1.1 and 1.2. Fourth, we globally describe the sequence of personality types in five-wave personality type trajectories (for instance UUURR).

Cross-sectional LCA. For each of the five waves, we estimated a set of cross-sectional LCAs on the entire sample, including all Big Five traits simultaneously. We used this strategy because earlier research has shown that the three personality types can be directly constructed from the Big Five traits (Akse et al., 2004; Dubas et al., 2002; van Aken, & Dubas, 2004). Analyses were performed using Mplus 5.21 (L. K. Muthén & Muthén, 2006). We used five criteria to determine the number of latent classes (B. Muthén & Muthén, 2000; Nagin, 2005). First, a solution with k classes should result in improvement of model fit compared with a solution with $k - 1$ classes, indicated by a decrease of the Bayesian information criterion (BIC; Schwarz, 1978). Second, adding an additional class should lead to a significant increase of fit, as indicated by the bootstrap likelihood ratio test (BLRT; Nylund, Asparouhov, & Muthén, 2007). Third, entropy—a standardized measure of classification of individuals into classes, based upon the posterior class probabilities—of the final class

solution should be acceptable. Entropy values range from 0 to 1, with values of .70 or higher indicating good classification accuracy (Reinecke, 2006). Fourth, if, while evaluating the content of the classes in the various solutions, an additional class in a solution with k classes were found to be a slight variation of a class already found in a solution with $k - 1$ classes, then we would choose the more parsimonious solution. Fifth, in order to make analyses of transitions between classes feasible, each class had to represent at least 5% of the sample (see also Speece, 1994).

We found the three-class solution to be superior to the one- and two-class solutions on both the BIC and BLRT across waves. The BIC of three-class solutions was at least 385.24 lower than that of one- or two-class solutions, and only in Wave 5 did the BLRT indicate that the three-class solution did not fit significantly better than did the two-class solution ($p = .09$). Entropy for the three-class solution ranged between .72 and .76, indicating good classification accuracy. Adding a fourth class did not provide additional unique information, given that the fourth class appeared to represent a variation of one of the other classes and was too small for meaningful transitional analyses (percentages ranged between 1.9 and 4.7 across waves). Therefore, we decided to use a three-class model in the LTAs.

Five-wave LTA. As part of the LTA, measurement invariance was assumed in the three-class LCA solutions across measurement waves. That is, we restricted the profiles of the three personality classes on the Big Five traits to be equivalent across five waves. We also restricted the variances of the Big Five traits to be equivalent across classes across waves. By assuming measurement invariance, we followed a convention used in most applications of LTA. Measurement invariance ensures that number and profiles of the classes are exactly the same across waves and allows for a straightforward interpretation of transition probabilities (see Nylund, Muthén, Nishina, Bellmore, & Graham, 2006). It is of importance to note that this approach differs in two respects from the analytical strategy of the three earlier longitudinal studies on personality types in adolescence. First, our approach uses a more empirical approach to determine the number of personality types. Cluster analysis was used by Akse et al. (2007b) and by van Aken and Dubas (2004), both of whom set the number of clusters at three and determined the profiles of the personality types by setting cluster centers for the Big Five traits. Asendorpf and van Aken (1999) used *Q* factor analysis, forced a three-factor solution, and used fixed criteria (factor loadings and additional discriminant analysis) to classify individuals. We did not a priori determine the number of personality types but instead tested whether a three-class solution was superior to a one- or two-class solution. As a consequence, we did not set profiles of personality types but rather allowed them to arise empirically from the data. Therefore, our approach ensures more optimal fit of the personality types to the data. Second, our approach uses the same classification criteria across waves, whereas the earlier three studies did not. Setting cluster centers for each wave separately does not take differences of Big Five means across waves into account, and using factor loadings for each wave allows different sets of factor loadings across waves to lead to similar classification. Both approaches may therefore lead to measurement errors that are remedied in our analytical strategy.

Figure 1 displays the profiles of the classes. Class 1 shows the typical profile of resilients, with high scores on all Big Five traits. Class 2 contains the overcontrollers, with low scores on extraversion and emotional stability and high scores on agreeableness and conscientiousness. Class 3 contains the undercontrollers, who scored high on extraversion and low on agreeableness and conscientiousness. Considering these defining characteristics, our profiles are similar to those found in earlier studies using the California Child Q-Set (Robins et al., 1996) or Big Five traits (Akse et al., 2004; Dubas et al., 2002).

We developed the final LTA model in two steps. We describe these steps and then present the results of the final model. In both steps, we selected the model with the lowest BIC value. The BLRT is not available for LTA models.

LTA Step 1: Nonstationary versus stationary transition probabilities. In the first modeling step, we compared a model with nonstationary transition probabilities between adjacent waves to a model with stationary transition probabilities. A model with nonstationary transition probabilities assumes that the likelihoods of

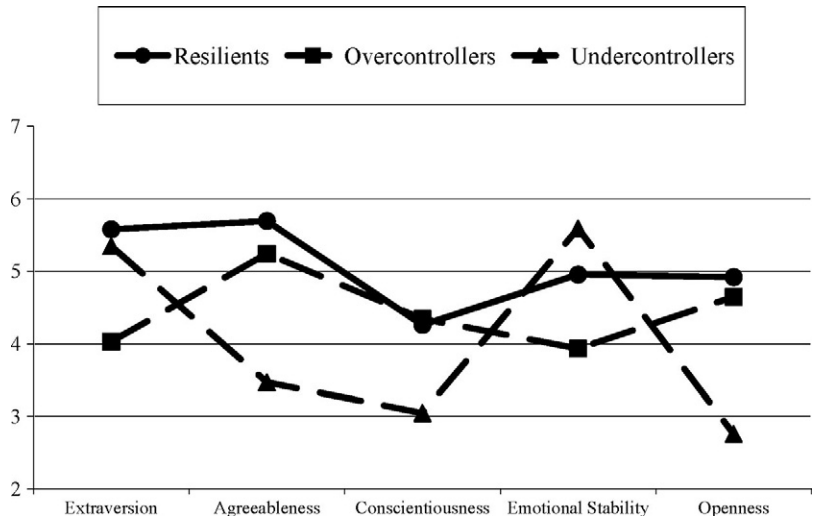

Figure 1. Profiles of the personality types on the Big Five traits across waves.

transitions between classes are different between waves. In contrast, a model with stationary transition probabilities assumes that the probabilities are equal across waves (for recent examples, see Kaplan, 2008; Nylund et al., 2006). Results indicated no significant differences in the transition probabilities across time. The BIC for the LTA model with stationary transition probabilities (88819.70) was lower than the BIC of the model with nonstationary transition probabilities (88887.85). This suggests that adolescents make transitions between personality types at the same pace across the four transitions points. As a result, there seems to be a regular pattern of stability and change in personality. Entropy of the stationary model was very good (.88).

LTA Step 2: Are there age and gender differences in personality type transitions? We added covariates to the model with stationary transition probabilities to describe heterogeneity in transitions between personality types., We included cohort as a covariate in the first model to test whether transitions into and out of personality types were different between the early-to-middle and middle-to-late adolescents. The second model tested whether transitions were different for male and female adolescents. The first model comparison indicated significant differences in the transition probabilities between the cohorts. The BIC for the LTA with cohort as a covariate (88811.94) was lower than the BIC of the model without the covariate (88819.70). The second model comparison indicated no significant gender differences in transition probabilities. The BIC for the LTA without gender (88819.70) was lower than the BIC of the model with gender (88826.42). So, rate of change into and out of personality types was different for early-to-middle and middle-to-late adolescents but not for male and female adolescents. Next, we present follow-up Bayesian analyses to clarify the cohort differences.

Increase and decrease of personality types over time (Hypothesis 1.1). Table 1, based on the final LTA model, displays the cell sizes for each of the personality types for Waves 1–5. Findings for the whole sample are in the upper section of the table. The table indicates a systematic increase of prevalence of resilients over time, along with a systematic decrease of overcontrollers and undercontrollers. This pattern of findings is consistent with Hypothesis 1.1. The table also suggests that resilients become the most prevalent personality type over time: 52.7% in Wave 5. The systematic pattern of increases and decreases of personality types is also found across both cohort and gender, as can be seen in the table.

To test Hypothesis 1.1 more stringently, we applied Bayesian model selection (Laudy & Hoijtink, 2007; Van de Schoot et al., 2011). We used the data in the upper section of Table 1 to test which of three alternative models of increase and decrease of personality types best fit the data. Model 1 assumed no increase or decrease of personality types across five waves, whereas Model 2 assumed an increase of resilients and a decrease of both overcon-

Table 1
Number and Percentage of Personality Types by Group and Wave

	Resilients		Overcontrollers		Undercontrollers	
Group and wave	*n*	%	*n*	%	*N*	%
Total sample (N = 1,313)						
1	535	40.7	655	49.9	123	9.4
2	588	44.8	643	49.0	82	6.2
3	618	47.1	606	46.2	89	6.8
4	657	50.0	583	44.4	73	5.6
5	692	52.7	576	43.9	45	3.4
Early-to-middle adolescence						
1	362	39.2	450	48.8	111	12.0
2	390	42.3	453	49.1	80	8.7
3	407	44.1	428	46.4	88	9.5
4	440	47.7	411	44.5	72	7.8
5	474	51.4	405	43.9	44	4.8
Middle-to-late adolescence						
1	173	44.4	205	52.6	12	3.1
2	198	50.8	190	48.7	2	0.5
3	211	54.1	178	45.6	1	0.3
4	217	55.6	172	44.1	1	0.3
5	218	55.9	171	43.8	1	0.3
Male (n = 637)						
1	239	37.5	317	49.8	81	12.7
2	274	43.0	312	49.0	51	8.0
3	303	47.6	273	42.9	61	9.6
4	325	51.0	256	40.2	56	8.8
5	347	54.5	256	40.2	34	5.3
Female (n = 676)						
1	296	43.8	338	50.0	42	6.2
2	314	46.4	331	49.0	31	4.6
3	315	46.6	333	49.3	28	4.1
4	332	49.1	327	48.4	17	2.5
5	345	51.0	320	47.3	11	1.6

Note. Findings are based on the final stationary 1-year interval model.

trollers and undercontrollers. In Model 3, the unconstrained model, the distribution of personality types over time was allowed to vary freely; no constraints were specified between the personality types across the five waves, thereby assuming that every cell size was equally likely. This unconstrained model can be seen as an empty model, or the alternate hypothesis in classical null hypothesis testing. The results are shown in Table 2. In the first comparison (see column A in the table), Models 1 and 2 were compared with the unconstrained model (Model 3). The BFs for Models 1 and 2 imply that, after observing the data, these models are approximately 1,000 times less likely and 7,616 times as likely, respectively, as the unconstrained model (Model 3). The second comparison (see column B) revealed that Model 2 is 7,616,400 times as likely as Model 1. PMPs of Models 1, 2, and 3 are <.001, .99 and <.001, respectively. In sum, Model 2, assuming increase in R and decreases in O and U, was by far the best fitting model. This model supports Hypothesis 1.1.

Transitions between personality types over time. The left side of Table 3 presents the transition probabilities of personality type change across 1-year intervals, as found in the final stationary model. The transition probabilities of personality change between Waves 1 and 5 are displayed on the right side of the table. The 4-year probabilities were calculated using the contingency tables of Waves 1 and 5, as generated by the final LTA model. We calculated these longer-term transition probabilities in order to demonstrate change in personality type across a longer period of time. As expected, given the consistency of personality type transition probabilities across time, the transitions with a relatively high frequency during 1-year intervals were also highly likely during the 4-year interval. Not surprisingly, stability of personality types was greater during 1-year intervals than during the 4-year interval, and transitions between personality types were more likely to have occurred across 4 years than across 1 year.

Table 3
Transition Probabilities of Personality Types During 1-Year Intervals (n + 1) and 4-Year Intervals (n + 4) Across Five Waves

Personality type in year *n*	Personality type in year *n* + 1[a]			Personality type in year *n* + 4		
	R	O	U	R	O	U
Resilients (R)	.95	.03	.02	.92	.07	.01
Overcontrollers (O)	.07	.89	.04	.21	.76	.03
Undercontrollers (U)	.29	.27	.44	.50	.34	.15

Note. Findings of the final stationary model. Transition probabilities sum up to 1.00 across rows for each interval set.
[a] For a stationary model, all transition probabilities are the same across waves.

Four findings are of particular interest. First, 1-year stability is always more likely than change in personality type. This is also true for 4-year stability, with one exception: 4-year stability of U is smaller than transition probabilities of U→R and U→O. Second, few adolescents moved into U or from R into O; during 1-year intervals, 4% or fewer of the adolescents made this transition, and 7% or fewer did so during the 4-year interval. Third, the percentage of transitions O→R, U→R, and U→O is substantial: Between 7% and 29% of the adolescents made these transitions during 1-year intervals, and between 21% and 50% did so over the 4 years of study. Fourth, findings suggest systematic personality change

Table 2
Bayesian Model Selection: Comparison of Various Sets of Models

Model	Model comparisons: BF A	BF B	PMP
H1.1: Differential increase and decrease of personality types over time			
1. No increase or decrease of residents (R), overcontrollers (O), or undercontrollers (U)	<.001[a]	1	<.001
2. Increase of R and decrease of O and U	7616.40	7616400	.99
3. Unconstrained	1[b]		<.001
H1.2: Differences in transitions between O and U and R, and O and U			
1. {O→R} = {O→U}; {U→R} = {U →O}	<.001[a]	1	<.001
2. {O→R} > {O→U}; {U→R} > {U →O}	4.02	4020	.80
3. Unconstrained	1		.20
ERQ1.1: Prevalence of personality types different between cohorts?			
1. No difference in prevalence of R, O, and U	<.001[a]	1	<.001
2. Systematic difference in prevalence of R, O, and U	80.34	80340	.99
3. Unconstrained	1		.01
ERQ1.2: Change and stability of personality types different between cohorts?			
1. No difference in change and stability	.016	1	<.001
2. Systematic difference in change and stability	16.13	1008	.94
3. Unconstrained	1		.06

Note. BF = Bayes factor; A = comparison of Models 1 and 2 with Model 3; B = comparison of Model 2 with Model 1; PMP = posterior model probability; H1.1/H1.2 = Hypothesis 1.1/1.2; ERQ1.1/1.2 = Exploratory Research Question 1.1/1.2.
[a] In the calculations of BFs, the value was set at .001. [b] Models with BF = 1 are the reference category.

into the direction of R. As predicted in Hypothesis 1.1, transition probabilities of O→R and U→R exceeded those of R→O and R→U, respectively, during 1- and 4-year intervals.

Differences in transitions between personality types (Hypothesis 1.2). Inspection of Table 3 revealed no support for Hypothesis 1.2, because transition probabilities of O→R, R→O, U→R, and R→U were not always bigger than those of O→U and U→O. Instead, the table suggests a modified version of this hypothesis, with transition probabilities of O→R exceeding those of O→U, and those of U→R exceeding those of U→O. Because we intended to test this hypothesis for only a substantial period of time, we applied Bayesian model selection to the 4-year transition probabilities of Table 3. Model 1 assumed transition probabilities of {O→R} = {O→U} and {U→R} = {U→O}, whereas Model 2 assumed transition probabilities of {O→R} > {O→U} and {U→R} > {U→O}. In Model 3, the unconstrained model, the transition probabilities of personality types between Waves 1 and 5 were allowed to vary freely. The results are shown in Table 2 (Hypothesis 1.2). The BFs for Models 1 and 2 imply that, after observing the data, these models are approximately 1,000 times less likely than and 4.02 times as likely as, respectively, the unconstrained model (Model 3). The second comparison revealed that Model 2 is 4,020 times as likely as Model 1. PMPs of Models 1, 2, and 3 are <.001, .80, and .20, respectively. In sum, Model 2 was the best fitting model, suggesting more substantial movement from O to R than from O to U, as well as more movement from U to R than from U to O. This model supports the modified second hypothesis.

Age group differences (Exploratory Research Questions 1.1 and 1.2). Exploratory Research Question 1.1 addressed age group differences in the prevalence of personality types. Table 2 (second and third upper sections) shows systematic cohort differences in the prevalence of the personality types in Waves 1 to 5. In all waves, the number of resilients is higher in the older age group, whereas the number of overcontrollers (with the single exception of Wave 1) and undercontrollers is higher in the younger age group. We applied Bayesian model selection to evaluate which of three alternative models of personality type prevalence in Waves 1 and 5, in both cohorts, provided the best fit to the data. Model 1 assumed no difference in prevalence between the cohorts, whereas Model 2 assumed a higher prevalence of R in middle-to-late adolescence and a higher prevalence of O and U in early-to-middle adolescence. Model 3, the unconstrained model, did not specify any constraints of the distribution of personality types across cohorts. Table 2 (Exploratory Research Question 1.1) presents the findings. The BFs imply that Model 1 is 1,000 times less likely than Model 3 and that Model 2 is 80.34 times more likely than Model 3. Moreover, Model 2 is 80,340 times as likely as Model 1. PMPs of Models 1, 2, and 3 are <.001, .99, and <.01, respectively. Replication of the same Bayesian models for Waves 2, 3, and 4 revealed similar differences between age groups. For considerations of space, we do not include a full report of these models. These findings answer Exploratory Research Question 1.1 and show that the middle-to-late adolescents are generally more often resilients, and less often overcontrollers and undercontrollers, than are the early-to-middle adolescents.

Exploratory Research Question 1.2 addressed age differences in the rate of change into and out of personality types. The second step of LTA modeling indeed revealed age group differences. Inspection of the 4-year transition tables indicated the general pattern of change and stability in personality to be the same across cohorts. The four key results we found for transitions in the whole sample seemed to generalize across age groups. Six cohort differences also appeared, however: Stability of R and O was lower in the younger age group, stability of U higher in the younger age group, probability of the transition U→R lower in the younger age group, and transition probabilities of both O→U and R→O higher in the younger age group. Differences in percentages between cohorts ranged between 3.4% and 18.1%. We used Bayesian model selection to evaluate which of three alternative models of personality change and stability in Waves 1 and 5, in both cohorts, provided the best fit to the data. Model 1 assumed no cohort differences in transition probabilities of R→R, O→O, and U→U stability, nor in the transition probabilities of U→R, O→U, and R→O. Model 2 assumed probabilities of R→R, O→O, and U→R to be lower in the younger age group and those of U→U, O→U, and R→O to be higher in the younger age group. Table 2 (Exploratory Research Question 1.2) presents the findings. The BFs imply that Model 1 is 62.5 times less likely than Model 3 and that Model 2 is 16.13 times more likely than Model 3 (see column A). Moreover, Model 2 is 1,008 times as likely as Model 1 (see column B). PMPs of Models 1, 2, and 3 are <.001, .94, and .06, respectively. The findings imply that stability of R and O, as well as movement into R, is more substantial in the older age group and that stability of U and movement into U and O is more substantial in the younger age group. Because we wanted to test this hypothesis for only a substantial period of time, we did not run Bayesian models for each of the adjacent waves.

Gender differences (Hypothesis 3). We found support for Hypothesis 3. In all waves, male adolescents were more often undercontrollers, and female adolescents were more often overcontrollers: $\chi^2(1)$ ranged between 5.44 and 27.99 across waves and φ ranged between .09 and .21 (all ps $< .05$). We did not find gender differences in the number of resilients. Only in Wave 1 was the number of resilients higher among female adolescents, $\chi^2(1) = 5.34$, $p = .021$, $\varphi = .07$. Additionally, we did not find gender differences in the second step of LTA modeling regarding rate of change into and out of personality types. The four primary results that we found for the transitions in the whole sample appeared to generalize across gender.

Personality type trajectories. Inspection of the five-wave personality type trajectories revealed two general patterns. First, 1,011 adolescents belonged to the same personality types in Waves 1 and 5. The vast majority of these participants (95.5%, or 73.5% of the total sample) belonged to the same personality type in all waves. Second, 302 adolescents belonged to different personality types in Waves 1 and 5: 79.1% of them made only one personality type transition, 16.6% made two transitions, and 4.3% made three or more transitions during the five waves. Thus, the majority of those who experienced personality changes made only one transition. These findings underscore the substantial stability of personality types in adolescence.

Conclusion. Figure 2 summarizes the main findings of the final LTA model. The figure is based on an additional Bayesian model selection, in which we constrained the probabilities of the 4-year transitions as follows: R→R > O→O > O→R; U→R;

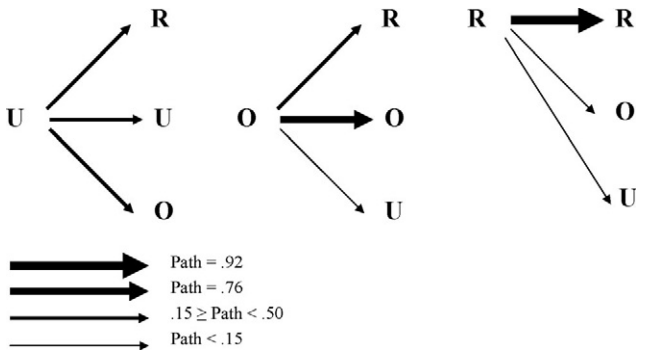

Figure 2. Transitions of personality types between Waves 1 and 5. R = resilients; U = undercontrollers; O = overcontrollers.

U→O; U→U > R→O; R→U; O→U. This model was clearly superior to a model in which the transitions were allowed to vary freely; PMPs of both models were .93 and .06, respectively. A similar model comparison of the 1-year transitions probabilities replicated these findings. The figure clearly shows that transitions into R are more prevalent than transitions out of R, that stability of R is greater than that of O and U, and that stability of O is greater than that of U.

Study 2

Our second aim was to study the links between the five-wave personality type trajectories and problem behavior and relationships. Results of Study 1 showed some groups to be too small to be included in the analyses of Study 2. Personality type trajectories with $n < 30$ in the total sample or $n < 5$ in one of the age groups were excluded to prevent problems with model estimations. Groups R→U, O→U, U→U, and U→O were excluded under this criterion, and groups R→R, R→O, O→O, O→R, and U→R were included. Because four of the five retained groups included resilients and/or overcontrollers, we decided to study problem behavior and relationships on which these personality type trajectories could be expected to differ, namely anxiety and the formation of intimate relationships.

Personality Types, Internalizing Problems, and Intimate Relationships

Internalizing problems. The personality types have been found to differ systematically in internalizing problems in adolescence. Overcontrollers typically score higher than resilients on general internalizing problems (Robins et al., 1996), and depression and moodiness in particular (Akse et al., 2004; Dubas et al., 2002). Because anxiety is known to be a key aspect of internalizing problems (Hale, Raaijmakers, Muris, Van Hoof, & Meeus, 2009), we decided to focus on generalized anxiety disorder.

Intimate relationships. Prospective studies have found that overcontrol and inhibition in childhood predict delays in the formation of intimate relationships. Dennissen et al. (2008) found that boys who were overcontrolled at ages 4–6 found an intimate partner 1.43 years later than did resilient and undercontrolled boys in late adolescence. Asendorpf, Dennissen, and van Aken (2008) and Kerr, Lambert, and Bem (1996) reported similar findings for inhibited children, and Caspi, Bem, and Elder (1988) found similar results for inhibited boys. These findings concur with those of cross-sectional studies indicating that overcontrollers are less sociable, more lonely, and less socially accepted by peers than are resilients and undercontrollers (Asendorpf et al., 2001; Scholte et al., 2005).

Hypotheses and Exploratory Research Questions

With regard to anxiety, we tested two hypotheses. Hypothesis 2.1 predicted that the R→R trajectory would have lower levels of generalized anxiety disorder than O→O over time, and Hypothesis 2.2 predicted that O→R and R→O trajectories would show differential growth of anxiety over time, with O→R showing less growth than R→O. In addition, we explored differences between U→R, on the one hand, and O→O and R→R, on the other hand (Exploratory Research Question 2.1).

With regard to the formation of intimate relationships, we tested Hypothesis 2.3, stating that O→O would be slower in the formation of intimate relationships than would R→R. We explored the differences between O→O, on the one hand, and O→R, R→O, and U→R, on the other hand (Exploratory Research Question 2.2).

Method

Participants. Excluding the R→U, O→U, U→U, and U→O groups reduced the sample size to $N = 1{,}226$ respondents (94% of the original sample). Gender and age distribution was not substantially different from the original sample (differences of ≤1.5%).

Measures.

Generalized anxiety disorder. The nine-item generalized anxiety disorder (GAD) symptoms scale of the original 38-item Screen for Child Anxiety Related Emotional Disorders (SCARED) scale (Hale, Raaijmakers, Muris, & Meeus, 2005) was employed in this study. Participants rated each symptom item on the following 3-point scale: 0 (*almost never*), 1 (*sometimes*), and 2 (*often*). A sample item is "I worry about what is going to happen in the future." The psychometric properties of the SCARED have been shown to be good (see e.g., Hale et al., 2005). In the present study, internal consistency coefficients (Cronbach's alphas) of the GAD scale ranged from .82 to .86 across waves.

Intimate partnership. Respondents indicated in each wave whether they currently had an intimate relationship lasting 3 months or more (yes or no).

Results

Personality type trajectories and anxiety. To test Hypotheses 2.1 and 2.2, we assessed whether the various personality type trajectories had different levels (intercepts) and change rates (slopes) of generalized anxiety disorder. To do so, we ran a series of multigroup latent Growth Models (LGMs) with the 10 personality type trajectories as groups (R→R, R→O, O→O, O→R, and U→R in early-to-middle and middle-to-late adolescents). Models were estimated with a robust maximum-likelihood estimation method (Satorra & Bentler, 1994). Model fit was judged by as-

sessing chi-square, comparative fit index (CFI), and root-mean-square error of approximation (RMSEA). CFIs above .90 and RMSEAs below .10 indicate acceptable model fit. Higher CFIs and lower RMSEAs indicate better model fit (Kline, 2010). We relied on three criteria to compare nested models: a significant chi-square difference test (Steiger, Shapiro, & Browne, 1985), a difference in CFI of >.01 (Cheung & Rensvold, 2002), and a difference in RMSEA of >.01 (Chen, 2007). Only if two of these criteria were met would we favor the less-parsimonious model and less-constrained model over the more-parsimonious model with additional constraints.

Inspection of the means and confidence intervals for intercept and slopes of anxiety in a freely estimated 10-group model revealed no differences between the early-to-middle-adolescent and middle-to-late-adolescent R→R, R→O, O→O, O→R, and U→R groups. In all following models, we therefore constrained the intercept and slope means of the five personality type trajectories to be equal across age groups (e.g., $R{\rightarrow}R_{\text{early-to-middle}} = R{\rightarrow}R_{\text{middle-to-young}}$).

To test Hypotheses 2.1 and 2.2, we ran three multigroup LGMs. We started with a fully constrained model with intercept and slope means equal across the 10 groups. This model did not fit the data adequately, $\chi^2(121, N = 1{,}226) = 472.52$, $p < .001$, CFI = .82, RMSEA = .15. In Model 2, we released the constraints of the intercept means. Intercept means of R→R, R→O, and U→R were allowed to differ from those of O→O and O→R. This model fitted the data better than did the fully constrained model, $\Delta\chi^2_{SB}(1, N = 1{,}226) = 90.95$, ΔCFI = .05, ΔRMSEA = .021. In Model 3, we subsequently released the constraints of the slope means, with slope mean specifications R→R = U→R = O→O ≠ R→O ≠ O→R. This model fitted the data better than did Model 2, $\Delta\chi^2_{SB}(2, N = 1{,}226) = 139.52$, ΔCFI = .07, ΔRMSEA = .043. The fit of Model 2 was adequate, $\chi^2(121, N = 1{,}226) = 242.05$, $p < .001$, CFI = .94, RMSEA = .09. Releasing further constraints did not lead to further improvement of fit, so we retained Model 3 as the final model.

Figure 3 depicts the final model. The findings in the figure support Hypothesis 2.1. Over time, R→R has a clearly lower level of anxiety than does O→O. The same holds true for U→R versus O→O. Intercepts of anxiety are clearly lower in R→R and U→R than in O→O, with values of 1.24 (95% CI [1.22, 1.26]) and 150 [1.47, 153], respectively, and no differences in slope means (.003, $z = 1.06$, $p = .29$). The findings in the figure also support Hypothesis 2.2. Anxiety clearly rises in R→O (slope mean = .08, [.05, .11], $z = 5.02$, $p < .001$), decreases in O→R (slope mean = –.07, [−.09, –.06], $z = -12.60$, $p < .001$), and didn't change in R→R, U→R, or O→O (slope mean = .003, $z = 1.06$, $p = .29$).

Personality type trajectories and intimate relationships. Cox regression survival analysis was conducted to test Hypothesis 2.3. This technique takes into account that a number of respondents will become involved in an intimate partnership after the final wave of the study ("censored cases"). In all models, effects of personality type trajectories for Waves 1–5 were adjusted for effects of covariates that might affect growth rates of intimate partnerships, including age, gender, and the interaction between personality type trajectories and age. We report only significant differences between personality trajectories and the reference group O→O. We use odds ratios (ORs) to present differential growth rates between personality type trajectories, gender, and age. Unless noted otherwise, p values of ORs were <.001.

There was a significant effect of personality type trajectories after adjusting for gender and age. Growth of intimate partnerships was significantly slower in boys ($OR \geq .68$, 95% CI [.58, .79], $p <$ .001) and in early-to-middle adolescents ($OR \geq .43$, [.34, .56], $p <$ .001). We found support for Hypothesis 2.3, because growth was

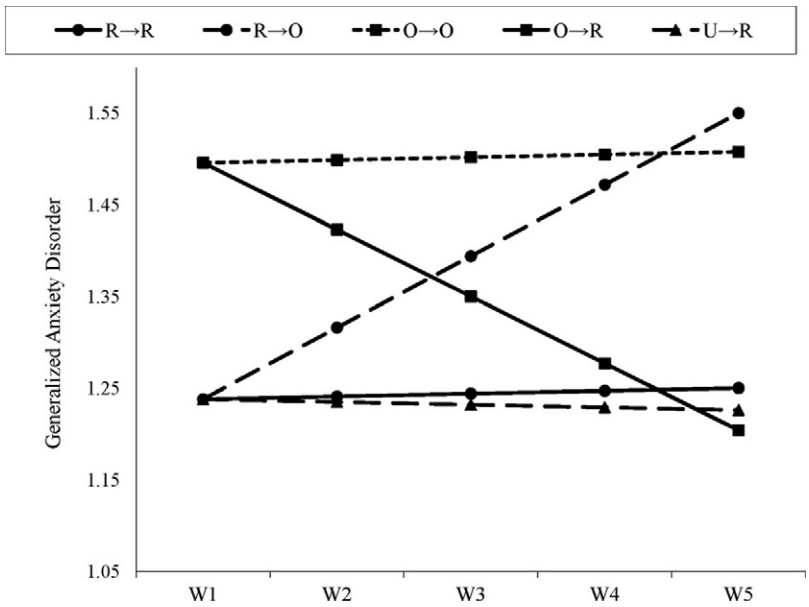

Figure 3. Development of generalized anxiety disorder in various personality type trajectories. Levels and rate of change of generalized anxiety disorder were similar across early-to-middle and middle-to-late adolescents. R = resilients; O = overcontrollers; U = undercontrollers; W1–W5 = Wave 1–Wave 5.

significantly slower in O→O than in R→R (*OR* ≥ 1.30, [1.01, 1.68], $p = .04$). There was no difference in growth between R→O and U→R, on the one hand, and O→O (*p*s > .53), on the other hand. One interaction was found, in which a faster growth of intimate partnership in O→R than in O→O was observed only in early-to-middle adolescents (*OR* = 2.15, [1.25, 3.71], $p = .006$). Figure 4 presents the differential growth rates between R→R, O→O, and O→R in both age groups.

Discussion

Change and Stability of Personality Types

The present study was designed to evaluate whether personality types are stable or change over time. We found substantial support for Hypothesis 1.1, in that we observed change of personality types in the direction of resiliency. In both age groups, the number of resilients increased and the number of overcontrollers and undercontrollers decreased. This pattern was mainly due to the fact that more adolescents made the transitions O→R and U→R than R→O and R→U. Differences between early-to-middle and middle-to-late adolescents were consistent with this developmental pattern in two respects. First, the prevalence of resilients was higher in the older age group, whereas the prevalence of overcontrollers and undercontrollers was lower. Second, patterns of stability and change revealed the transitions R→O and R→U to be less prevalent in the older group and stability of resilients (R→R) to be higher. In other words, there is less change from resilience into the personality types of over- and undercontrol in middle-to-late adolescence than in early-to-middle adolescence. Taken together, these findings clearly show personality development in the direction of the resilient type during adolescence. They also converge with findings of a recent study by Meeus, Van de Schoot, Keijsers, Schwarz, and Branje (2010), who found systematic identity maturation in adolescence, characterized by a systematic increase in achievement and decreases in moratorium and diffusion.

We also found substantial stability of personality, with 73.5% of the adolescents remaining in the same personality type between Waves 1 and 5. This finding shows that personality types are already quite stable in adolescence. Our stability percentage of 73.5 is substantially higher than those of other adolescent studies (Akse et al., 2007b; Asendorpf et al., 2001; van Aken & Dubas, 2004). Not only was stability higher in our study but it was also observed over a longer period of time than in the other studies. This dissimilarity might be due to methodological differences. We used the latent class approach, whereas the other studies applied cluster analysis. As explained in the Method section, the latent class approach can be considered superior for a number of reasons. We also restricted the profiles of the personality types to be equivalent over time, as well as the variances of their constituting Big Five traits. Assuming this kind of measurement invariance ensured the personality type profiles to be the same across waves and allowed for a more straightforward interpretation of personality transitions than in earlier studies. It should additionally be noted that not assuming measurement invariance across time and using a more conventional statistical technique, such as cluster analysis, would have resulted in less-reliable classification of individuals and, consequently, less stability of personality types over time.

We also found support for a modified version of Hypothesis 1.2. The initial Hypothesis 1.2 was based on findings by Asendorpf and van Aken (1999), who showed that overcontrollers and undercontrollers are more discrete from each other than they are from resilients. Therefore, we expected higher transition probabilities between either overcontrollers and resilients or undercontrollers and resilients than between overcontrollers and undercontrollers. Because transition probabilities of R→O and R→U were extremely low, we tested a modified version of this hypothesis, stating that O→R > O→U and that U→R > U→O. This modified Hypothesis 1.2 was strongly supported by the data, which indicated that the greater discreteness between overcontrollers and undercontrollers than between either of these types and resilients is conditional upon a developmental pattern characterized by movement of overcontrollers and undercontrollers in the direction of resilients.

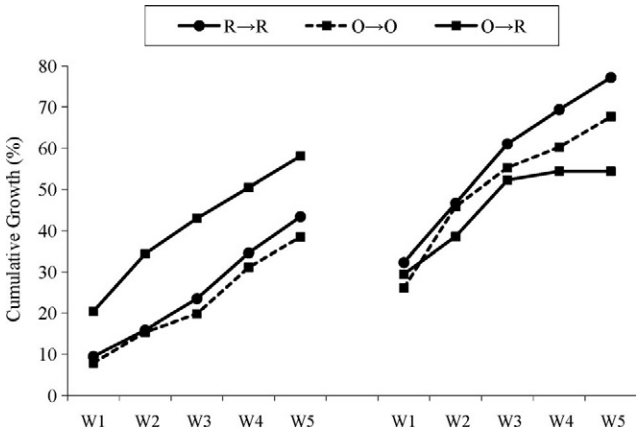

Figure 4. Growth rates of intimate partnership for various personality type trajectories in early-to-middle and middle-to-late adolescents. R = resilients; O = overcontrollers; W1–W5 = Wave 1–Wave 5.

Personality Type Transitions

The transitional analyses (see Figure 2) imply that the resilient type serves more often as the end point of personality development in adolescence than does overcontrol or undercontrol. Transitions in the direction of the resilient type are more prevalent than transitions in the direction of over- or undercontrol, and the stability of the resilient type is the highest. This conclusion suggests that the resilient type indexes the most well-adjusted personality profile and is consistent with the findings of Study 2 showing that resilients are the least anxious and most capable of forming intimate relationships.

The transitional analyses also show that adolescents move away from undercontrol, with virtually nobody moving toward it. Also, and in agreement with earlier studies (Aksan et al., 1999; Akse et al., 2007b; Hart et al., 2003), the stability of undercontrol was found to be low. These findings suggest that undercontrol peaks in early-to-middle adolescence and decreases substantially thereafter. More longitudinal studies covering the time span from early adolescence and adulthood are needed to determine the prevalence of undercontrol in these phases of life.

Finally, the analyses of the personality type trajectories revealed that the majority of adolescents who change personality type across 5 years make only one transition. This makes clear that personality type changes tend to be decisive in adolescence and that probabilities of additional personality type changes are low.

Gender Differences

We replicated the well-known finding that male adolescents more often tend to be undercontrollers, and female adolescents overcontrollers. We did not find systematic gender differences in the number of resilients or in the change and stability of personality types.

Personality, Adjustment, and Adaptation

The multigroup LGMs supported Hypotheses 2.1 and 2.2 regarding personality type trajectories and generalized anxiety disorder. Stable resilients (R→R) were less anxious over time than were stable overcontrollers (O→O), and change from O→R was accompanied by a decrease in anxiety, whereas change from R→O was accompanied by an increase in anxiety. These findings show systematic differences between resilients and overcontrollers in anxiety and underscore the validity of the changes in personality that we have found. Most adolescents who change personality type do so only once, and therefore these changes seem to be quite decisive. The increase and decrease of anxiety in the R→O and O→R trajectories, respectively, seem to indicate that these changes are systematically linked to adjustment. Our findings that the U→R trajectory is systematically lower in anxiety than is the O→O trajectory is consistent with earlier findings that overcontrollers differ from resilients and undercontrollers in internalizing problems (Akse et al., 2004; Robins et al., 1996).

The findings with regard to intimate relationships concur with those on personality and anxiety. The more-anxious persons, O→O, are slower in the formation of intimate relationships than are the less-anxious persons, R→R. Further, the adolescents who develop from high to low anxiety (O→R) are faster than are the stable overcontrollers. This result was obtained only in the early-to-middle adolescents, however. Taken together, these findings imply that overcontrol goes together with anxiety and an inability to enter into the world of social relationships. Additionally, moving out of overcontrol means leaving anxiety behind and being more able to grow into the social world. That this finding was obtained only in early-to-middle adolescents suggests that changing from overcontrol to resilience results in more-optimal social development when it does not come too late in adolescence. The result that the R→O adolescents do not differ from the O→O adolescents in the formation of intimate relationships is consistent with the general pattern we have found. With regard to the formation of intimate relationships in the U→R adolescents, our findings are inconclusive. Results of the survival analysis suggest that the U→R adolescents might be faster in the formation of intimate relationships, compared with the O→O adolescents ($OR = 1.30$) but did not reach significance due to the small sample size of the U→R group.

Personality Development in Adolescence Revisited

In the introduction, we showed that there is systematic evidence that personality becomes more stable and mature in adolescence. Variable-centered studies, in particular, have shown that personality traits become more mature (Roberts et al., 2006) and stable (Roberts, & DelVecchio, 2000) as adolescents age. We also showed that longitudinal, person-centered studies into adolescent personality are scarce. Until now, only one study (Klimstra et al., 2009) revealed that personality profiles become more formally organized over a longer period of time. The three longitudinal studies into adolescent personality types (Akse et al., 2007b; Asendorpf et al., 2001; van Aken & Dubas, 2004) did not test for patterns of increase and decrease in prevalence of the three personality types or for transitions between types. Therefore, the main aim of this study was to address the gaps in knowledge about change and stability in adolescent personality types. The main conclusion of the research is that personality types mature in the direction of resiliency. This means that research into adolescent personality development has come full circle. Adolescent personality matures not only in terms of mean levels and stability of personality traits but also in terms of personality organization. The study by Klimstra et al. (2009) showed maturation of personality profiles in adolescence, that is, that the relative order of importance of Big Five traits becomes more stable as adolescent age. The present study adds to this conclusion by showing that personality profiles mature by moving in the direction of the resilient profile. Thus, for all four known indices of personality change, there is now evidence of personality maturation in adolescence.

Our study also revealed that changes in personality are linked to changes in anxiety and formation of intimate relationships. This means that personality change is related to changes in other behavioral spheres and that personality change is more than only a change of self-definition. A challenge for future research would be to study the extent to which personality change is linked to changes in behavior. For instance, it is not yet known whether personality change is linked to changes in more fundamental behavioral responses such as behavioral inhibition and activation (Gray, 1987) or emotion regulation (Silk, Steinberg, & Morris, 2003).

Limitations and Suggestions for Further Research

Several limitations of the present study should be recognized. First, our study mainly presents descriptive findings on change and stability of personality types. We did not study why personality changes or holds stable during adolescence or why certain personality transitions are more likely than others. Our finding that personality type transitions seem to be quite decisive calls for research aimed at specifying conditions that predict the timing of these transitions. Longitudinal studies with a focus on the link between personality change and relational, educational, and occupational transitions might be a good option here. Preferably, such studies should include adolescents and emerging adults, in order to test effects of social investment as proposed by Roberts et al. (2006). Social investment in adult roles grows substantially during emerging adulthood, and transitions to the resilient type should therefore be more prevalent among emerging adults than among adolescents.

A second limitation of the present study concerns the 1-year intervals between measurements. A design with shorter measurement intervals would offer better opportunities to more exactly determine timing and conditions of personality change.

Third, although we covered adolescence from the ages of 12 to 20, we accomplished this by using two cohorts with only one overlapping year (Wave 5 and Wave 1 of the younger and older cohort, respectively). A design following the same adolescents from 12 until 20 would allow for more precision on issues of timing and number of personality transitions during adolescence. For instance, it would probably have prevented the problem that curves of cumulative growth in intimate relationships among R→R and O→O did not perfectly overlap between the younger and older cohorts, respectively (see Figure 4). On the other hand, the R→R and O→O curves show a consistent pattern of cumulative growth in intimate relationships when all five waves are taken into account.

Future studies should address not only the link between life transitions and personality change but also the relational context of personality development. Especially for early-to-middle adolescents, it is important to study whether parenting could effectively reduce the differential risks run by overcontrollers and undercontrollers. Well-known risks for overcontrollers are depression (Dubas et al., 2002), anxiety (Akse et al., 2007b), and loneliness (Scholte et al., 2005), and well-known risks for undercontrollers are aggression (Asendorpf & van Aken, 1999) and antisocial behavior (Newman, Caspi, Moffitt, & Silva, 1997). Can more supportive parenting stimulate overcontrollers to engage in more social interaction with peers? Can stricter parental monitoring prevent the antisocial behavior of undercontrollers? Studying differences in friendship formation between the personality types might additionally be an interesting avenue for investigation. Friends might be a critical, mediating link between personality and subsequent problem behavior.

Despite these limitations, the present study has contributed significantly to the understanding of change and stability of personality types in adolescence. It is the first five-wave study, using a broad-range sample of early-to-middle and middle-to-late adolescents, to show how personality types develop between the ages of 12 and 20. It is also the first study to elucidate which personality transitions are most likely characterize this developmental process. The composition of our sample suggests that our findings may be generalizable to individuals who are in various types of educational tracks during adolescence. Findings of our study may be less generalizable to adolescents who enter the labor force early or to adolescents from ethnic minority groups. Our hope is that these findings will inspire more longitudinal research into development of personality types.

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