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Title: On the road to adulthood. Delinquency and desistance in Dutch emerging adults
Issue Date: 2019-09-26
Youth is wild, and Age is tame:
Age, I do abhor thee;
Youth, I do adore thee

*William Shakespeare, A Madrigal*
Growing up: How personality maturation and adult role transitions relate to desistance from delinquency

5.1 Abstract

Transitioning into adult roles and personality maturation are two important changes that the majority of young people experience as they exit adolescence and become adults. For young people who engaged in delinquency as adolescents, it is also a time when many desist from delinquent behavior. In this paper, we examine for the first time how personality maturation and adult roles transitions are related to changes in delinquency during emerging adulthood. Our analyses focus on within-individual change, therefore controlling for individual differences, which likely affect two or more of our factors of interest. Using multilevel mediation models, we test for multiple directions of effect between these three factors, on a general population sample of Dutch emerging adults measured at two time points, as they enter adulthood and six years later (age T1 M=18.7, T2 M=24.6). Our findings show that declines in delinquency predict transitioning into adult roles, but that this relationship is fully mediated by increases in conscientiousness, lending support, we argue, to the cognitive transformation theory of desistance.

Keywords
personality maturation; adult role transitions; desistance; cognitive transition theory; social investment principle
5.2 Introduction

The link between crime and personality has long been the subject of fascination (Eysenck, 1977; Wortley, 2011). It has been widely studied within the criminological field, with findings indicating that certain personality traits, such as low conscientiousness, are related to criminal behavior (Agnew, Brezina, Wright, & Cullen, 2002; Caspi et al., 1994; Steiner, Cauffman, & Duxbury, 1999; van Gelder & de Vries, 2012). The association between criminal behavior development and personality development has also been examined, with findings indicating that change in one area is related to change in the other (Ge & Conger, 1999; Klimstra, Akse, Hale, Raaijmakers, & Meeus, 2010). In addition, thanks to the growth of life-course criminology, the development of criminal behavior over time has been the subject of numerous studies, with theories and empirical studies addressing how changes in local life circumstances, such as transitioning into adult roles, are related to changes in criminal behavior. What is perhaps less well known amongst criminologists is that personality change has also been related to transitioning into adult roles. This is described as the social investment principle. The period of emerging adulthood, from age 18 to the mid to late 20s, is generally marked by considerable changes in all of these areas, delinquency, personality, and adult roles. However, to our knowledge, the relation between these three factors, personality maturation, transitioning into adult roles, and changes in delinquent behavior, has not yet been examined in one study.

In this paper, we explore personality change and delinquency change together with transitions into adult roles using a longitudinal dataset with a general population sample of Dutch emerging adults. We examine within-individual changes in personality and delinquent behavior over time, relating these to the transitions young people make into adult roles. By focusing on within-individual change, we can test for how change in one area relates to change in another, whilst automatically controlling for stable differences between individuals. Using multilevel mediation models, we examine the direction of effect in the relations between personality change, transitioning into adult roles, and changes in delinquent behavior.

5.2.1 Personality change and delinquency change in emerging adulthood

Personality is the set of psychological characteristics that define an individual. It can be formally structured into a number of different traits, which are used to describe differences between individuals. Personality traits are, in contrast to states, relatively enduring over time and situation. This implies that people behave consistently, from one day to the next and from one situation to the next (Costa & McCrae, 1994). The Five Factor Model (McCrae, 1990), or the Big Five, is a widely-
used model of personality traits. In this model individuals are distinguished on
the following traits: extraversion, conscientiousness, agreeableness, openness to
experience, and neuroticism, each of which can be further split into lower-level
facets. Much previous research on personality and delinquent behavior has looked
at between-individual differences using cross-sectional data (see, for example, a
meta-analysis by Miller & Lynam, 2001). Findings show that antisocial individuals
are characteristically low in agreeableness and low in conscientiousness.

Whilst personality traits are generally considered to be stable (Costa & McCrae,
1994), there is evidence to indicate that personality is ‘plastic’: it can and does
change throughout the life course (Roberts, Walton, & Viechtbauer, 2006; Soto,
John, Gosling, & Potter, 2011; Srivastava, John, Gosling, & Potter, 2003). Similarly,
as dynamic theories of criminal behavior posit, criminal behavior also changes
throughout the life course, with the most dramatic changes occurring during
adolescence (increases) and emerging adulthood (decreases). Looking at personality
and criminal behavior longitudinally puts researchers in a better position to explore
how these two factors might be related, by examining whether change in one area
is related to change in the other.

Within the personality literature there are two models which address a possible
causal relationship between personality and problem behaviour: the vulnerability
model and the scar model (Tackett, 2006). The vulnerability model posits that
possessing certain personality traits puts young people at higher risk of developing
problem behaviour. In contrast, the scar model posits that exhibiting problem
behaviour leads to changes in personality, such as lower conscientiousness or agree-
ableness. A study by Klimstra and colleagues (Klimstra, Akse, Hale, Raaijmakers,
& Meeus, 2010), using an adolescent sample, tested these models concurrently,
finding evidence for both directions of effect, and thus support for both models.
During emerging adulthood we generally see decreases in delinquent behavior,
as the well-known age-crime curve demonstrates (Farrington, Loeber, & Jolliffe,
2008; Sweeten et al., 2013). The vulnerability and scar model lead to different
expectations. According to the vulnerability model, we might expect to only see
these decreases amongst individuals possessing certain personality traits, while
according to the scar model, we might expect decreases in delinquent behavior to
lead to changes in personality. On average, the changes in personality that we see
during emerging adulthood are towards increased growth and maturation (Caspi,
Roberts, & Shiner, 2005; Lodi-Smith, & Roberts, 2007). But, can we link these
changes to changes in delinquency during this period of the life course?

Pioneering life-course criminologists the Gluecks (Glueck & Glueck, 1950) put
the drop in criminal behavior during the early adult years down to psychosocial
maturation. More recently scholars examining changes in personality and antisocial
behavior specifically in emerging adulthood, propose that the desistance from
delinquency that occurs during adulthood is paralleled by changes in personality during these periods, i.e., they co-develop (Monahan, Steinberg, Cauffman, & Mulvey, 2009; Morizot & Le Blanc, 2005). A small number of studies have examined and found evidence for this co-development during emerging adulthood. Monahan and colleagues (2009) found that whilst the vast majority of their sample of serious juvenile offenders demonstrated personality maturation as they transitioned into adulthood, those who desisted from offending during this period showed the greatest increases in impulse control and suppression of aggression. Looking at alcohol use disorders, Littlefield, Sher and Wood (2009) showed that decreases in problematic alcohol use corresponded to decreases in impulsivity and neuroticism during emerging adulthood. In a person-centered study of college students, Blonigen and colleagues (Blonigen, Littlefield, Hicks, & Sher, 2010) found that desisters from anti-social behavior showed the greatest mean-level decreases in novelty seeking and increases in reward dependence, in contrast to persisters, who did not show the same level of decline. In demonstrating that, whilst the general trend is towards desistance and maturation in emerging adulthood, those who simultaneously do not desist do not mature, these studies provide support for the idea of co-development.

However, as Blonigen (2010), in his essay linking personality change and delinquency change, points out, co-development does not mean that there is a causal relationship between the two. Blonigen suggests that a possible third mechanism contributes to change in both delinquency and personality during emerging adulthood rendering any association between the two spurious. This is in contrast to the scar and vulnerability models discussed earlier, which do argue for causality.

Blonigen (2010) offers two possible mechanisms for the co-development of delinquency and personality: biological and sociological. We focus on the latter for the following reasons. Personality maturation during emerging adulthood has been linked to transitioning into adult roles. Similarly, life-course criminological theories draw upon transitioning into adult roles as an explanation for the changes in, or desistance from, delinquent behavior that occurs so rapidly during the early adult years. As previously stated, changes in personality and delinquency have not yet been simultaneously empirically tested with relation to transitioning into adult roles. We therefore discuss theories and evidence for the relationship between each separately before introducing the current study.

5.2.2 Personality change and adult social roles
Personality change during emerging adulthood generally conforms to the maturity principle (Roberts, Caspi, & Moffitt, 2001), in that we see increases in emotional stability, conscientiousness, and agreeableness during this period (Blonigen,
Growing up: How personality maturation and adult role transitions relate to desistance from delinquency

Carlson, Hicks, Krueger, & Iacano, 2008; Roberts, Walton, & Viechtbauer, 2006). Within the field of personality psychology, the social investment principle argues that adult social roles are the driving force behind personality maturation in emerging adulthood (Roberts, Wood, & Smith, 2005; Roberts, Wood, & Caspi, 2008). The theory is that conventional, normative adult roles come with certain expectations. If people commit to these roles, they are required to become more nurturing, more responsible, and more stable. Consequently, their personalities change (Roberts, Wood, & Caspi, 2008). Previous studies have demonstrated that as people enter adult roles, above all career-related employment and romantic relationships, they increase in conscientiousness and emotional stability, and decrease in neuroticism (Bleidorn et al., 2013; Hudson, Roberts, & Lodi-Smith, 2012; Lodi-Smith & Roberts, 2007; Neyer & Asendorpf, 2001; Roberts, Wood, & Smith, 2005). Further support for the theory is lent by evidence that de-investment can occur (Hudson, Roberts, & Lodi-Smith, 2012), whereby, for example, decreases in emotional stability are associated with negative work experiences (Roberts et al., 2006).

Previous research has also demonstrated that investment in adult social roles and personality change is a reciprocal process. A study by Parker and colleagues (Parker, Lüdkte, Trautwein, & Roberts, 2012) of German post-high school youth found that changes in romantic relationships were associated with changes in personality, but also that personality at time one predicted relationship quality at time two. Roberts, Caspi, and Moffitt (2003) found that personality traits that predicted certain work experiences, such as commitment and autonomy, also then changed in relation to those work experiences. Specht, Egloff, and Schmulke (2012) found that personality both predicted major life events and in turn changed following these events. These findings indicate that, as Blonigen (2010) laid out for personality change and delinquency change, personality change and transitions into adult roles also co-develop.

5.2.3 Delinquent behavior change and transitions into adult roles
The idea behind the social investment principle, that entering adult roles, which demand responsibility and adherence to conventional societal norms, results in personality change, is echoed in prominent life-course criminological theories of criminal behavior change. Sampson and Laub’s (Laub & Sampson, 2003; Sampson & Laub, 1993) age-graded theory of informal social control posits that forming social bonds with institutions and other individuals within conventional society during adulthood can lead to desistance from criminal behavior. They refer to adult roles as ‘turning points’ in the lives of offenders. Moffitt (1993), in her dual taxonomy theory, argues that as adolescence-limited offenders exit adolescence and gain access to legitimate adult social roles, their motivation for delinquency decreases, and thus they desist, i.e., exhibit behavior change. Giordano’s theory of cognitive
transformation (Giordano et al., 2002) also recognizes the importance of adult social roles, but emphasizes that these roles are not randomly assigned. Offenders need to undergo a cognitive transformation before they can make the most of the ‘hooks for change’ (p.4) offered by a spouse or employment. Empirical evidence for the desistance effect of transitioning into adult roles is substantial. Studies in both the US and Europe have demonstrated desistance effects of, for example, employment (e.g., Savolainen, 2009; Verbruggen, Blokland, & Geest, 2012) and marriage (e.g., Blokland & Nieuwbeerta, 2005; King, Massoglia, & Macmillan, 2007; van Schellen, Apel, & Nieuwbeerta, 2012). A more recent study has found this also to be true for contemporary emerging adults entering adult roles more relevant to this generation, such as living independently and engaging in non-marital relationships (Hill, Blokland, & Geest, 2016). However, a study by Zoutewelle-Terovan and Skardhamar (2016) found that offending declined prior to childbirth. Similarly, Skardhamar and Savolainen (2014) found that desistance also occurred prior to entry into employment. Huschek and Blokland (2016) found that older males who continued to offend were less likely to become fathers than those who had desisted, indicating that a change in behavior may occur before transitioning into parenthood. These findings demonstrate that the desistance process can begin before entry into adult roles is undertaken.

We can sum up the literature on these three intertwined factors thus: personality change and delinquency change likely co-develop in emerging adulthood, personality change has been shown to be related to entering adult roles, and entering adult roles has been consistently linked to desistance from delinquency, with some studies showing desistance occurs prior to adult roles and others indicating that adult roles occur prior to desistance. There are, however, questions about how these three factors interrelate. That adult social roles are linked to desistance and to personality change, and we know that personality change and delinquency change co-develop, suggests that the link between adult social roles and delinquency change is mediated by personality change.

5.2.4 The current study
In the current study, we set out to examine whether transitioning into adult roles and changes in personality are related to changes in delinquent behavior in a sample of Dutch emerging adults. As outlined above, research has found that these three factors are related, but examining all three in one study has not yet been done. We examine transitioning into adult roles, changes in personality, and changes in delinquent behavior between two points in time: as young people are entering emerging adulthood and then again six years later. In this study, we examine the relations between adult role transitions, personality change, and delinquency change. We tested whether transitioning into adult roles predicts a decrease in delinquency, and whether this relationship is explained (mediated) by changes in
personality. Based on findings that desistance occurs prior to adult role transitions we also test whether decreases in delinquency predict transitions into adult roles, and whether this relationship is explained by changes in personality.

5.3 Method

5.3.1 Participants
Participants for this study came from the Conflicts and Management of Relationships study (CONAMORE: Meeus et al., 2006), a longitudinal study of Dutch adolescents carried out in The Netherlands. Ethical approval for the study was sought and provided by the board of a local research institute. At wave one the study comprised two age cohorts: adolescents aged under 16 ($M_{\text{age}}=12.46$) and those aged over 16 or over ($M_{\text{age}}=16.88$). In this study, we use only the sample aged 16 or over at wave one ($N=390$). This study makes use of the third (T1; $N=368$) and sixth measurement (T2; $N=290$) waves of the study. At T1 the sample had all reached the age of 18 ($M=18.67$, $SD=0.8$), i.e., had reached legal adulthood; at T2, collected six years later, average age was 24.6 ($SD=0.77$). Slightly over half the sample was female (T1: 57%; T2: 59%) and the majority was ethnically Dutch (T1: 87%; T2: 90%).

At the first wave of the CONAMORE study 390 older adolescents took part, 368 participants took part in wave three, and 268 completed all the measurements at wave six. Attrition is therefore an issue. The pattern of missing values was evaluated with Little’s MCAR test using all the variables from this study, as well as demographic variables. The test indicated that the data was missing at random $\chi^2 (N=390, 41) = 28.322, p=.933$. We therefore applied full information maximum likelihood for our model estimations.

5.3.2 Procedure
Participants were recruited from 12 high schools and vocational further education colleges located in Utrecht province in the Netherlands. Once participants and their parents had received detailed information on the study those who chose to participate provided written consent. Students filled out the questionnaires for the first wave during school hours and for the following waves during home visits from research assistants. The first five waves were carried out annually, and the sixth wave was carried out after a break of four years. This sixth wave was collected in 2009/2010. The questionnaires for the first five waves consisted of a number of psychometric scales, covering areas from depression, aggression, and delinquency, to details of relationships with parents and peers. In addition to these, at the wave six interview a life history calendar was taken. In the calendar participants provided details of living arrangements, educational history, employment history, relationship history,
parenthood, and other important life events since the age of 12 years. In the current study, we make use of the Big Five personality measures and the delinquent behavior scales taken during the third (T1) and sixth (T2) measurement waves. There was therefore a period of six years between T1 and T2. We use the life history calendar to determine the adult roles transitioned into throughout the study period.

5.3.3 Measures

**Personality.** The personality dimensions extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience were measured using the Dutch shortened version of the Big Five questionnaire at both measurement waves (Gerris et al., 1998; Goldberg, 1992). This measure contains 30 characteristics, six relating to each of the dimensions, e.g., talkative (extraversion), helpful (agreeableness), neat (conscientiousness), anxious (emotional stability), and creative (openness to experience). Participants rated on a scale of 1 to 7 how much each characteristic applied to them. Reliability coefficients were high, with alphas ranging from 0.76 to 0.94. A factor analysis (Principal Axis Factoring, direct oblimin rotation) carried out independently on both waves identified five unique factors, accounting for 52% and 59% of total variance.

**Delinquency.** Delinquency was measured at both measurement waves using a scale previously developed for a Dutch sample (Baerveldt, van Rossum, & Vermande, 2003). Participants indicated whether they had committed any of a list of 16 delinquent acts during the previous 12-month period, and if so whether they had committed the act once, two-three times, or four times or more. Two items were removed from the scale, using marijuana and being arrested by the police, as these do not represent offences under Dutch law. The 14 resulting items included shoplifting, stealing a moped or scooter, breaking and entering, and being involved in a fight. We summed these items to create a count scale. See Appendix A for a full list of offences.

**Adult role transitions.** At T2 a life history calendar (LHC) was completed by 268 participants (Meeus, 2010). The information collected covered all changes in living situation, education, and romantic relationships since the age of 12, as well as employment once no longer in education, marital status, and parenthood. We determined from this information whether participants had transitioned into the adult roles of living independently of parents, cohabiting, marriage, employment when no longer in education, and being a parent. Using this information, we created two variables indicating the number of transitions undergone prior to T1 and those undergone prior to T2 when the LHC was taken, such that a maximum score of 5 would indicate that all transitions had occurred.
5.3.4 Analytic Strategy

We first examined absolute stability (comparing mean values at T1 and T2) and relative stability (the correlation between scores at T1 and T2) to understand how our key variables have changed over time. We also examined intraclass correlations (ICC), which indicate the percentage of total variance accounted for at the between-individual level compared to the within-individual level.

To test how change in one area was related to change in another, we examined within-individual changes over time. For each variable, we first calculated the mean score for each individual from the T1 and T2 scores, i.e., their person mean. We next calculated variables which indicate within-individual change between T1 and T2. These variables were, for each individual, the deviation of their score at T1 from their person mean and the deviation of their score at T2 from their person mean (see Allison, 2009). For example, if a participant scores 3 for conscientiousness at T1 and 4 for conscientiousness at T2, their person mean is 3.5. Therefore, their deviation score at T1 is -0.5 and their deviation score at T2 is 0.5. The within-individual change variables were used as the independent and mediator variables in our models. By looking at within-individual changes over time in this way we automatically controlled for any stable unobserved differences between participants that may be linked to personality, adult role transitions, and delinquency. We were able to focus specifically on whether change in one area is related to change in another.

We first examined the correlations between these within-individual change variables. On the basis of significant correlations between all three factors, we examined whether personality change predicted adult roles transitions, whether adult role transitions predicted delinquency change, and whether personality change predicted delinquency change, in each case also examining the reverse direction of effect. We then examined whether there was evidence for full or partial statistical mediation of any of these relationships, by testing for direct and indirect effects. Due to the high number of statistical tests, a correction rate was applied to the significance level to decrease the probability of making a Type I error (Benjamini & Hochberg, 1995; corrected alpha is $p<.045$). All models were estimated using multilevel structural equation modelling in Mplus, following the method from Preacher, Zyphur, and Zhang (2010). The multilevel structure indicates that time (level 1) is nested within persons (level 2). In the models with delinquency as dependent variable, negative binomial models were run, as delinquency was an over-dispersed count variable where the variance is larger than the mean (T1: $M=2.48$, $SD=5.11$, variance$=26.15$;

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24 These mean scores were used to examine between-individual differences. We do not present these results, however, as we believe these are not relevant to testing our hypotheses regarding change over time.
Table 1. Descriptive details and correlations at T1 (below the diagonal) and T2 (above the diagonal; correlations between same measures on the diagonal)

<table>
<thead>
<tr>
<th></th>
<th>Extraversion</th>
<th>Agreeableness</th>
<th>Conscientiousness</th>
<th>Emotional stability</th>
<th>Openness to experience</th>
<th>Transitions</th>
<th>Delinquency</th>
<th>M SD (T2)</th>
<th>ICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraversion</td>
<td>.629</td>
<td>.245</td>
<td>-.001</td>
<td>.325</td>
<td>.237</td>
<td>.079</td>
<td>.041</td>
<td>4.79 5.12</td>
<td>.77</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>.248</td>
<td>.388</td>
<td>.159</td>
<td>.049</td>
<td>.281</td>
<td>.125</td>
<td>-.152</td>
<td>5.81 0.58</td>
<td>.558</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>-.065</td>
<td>.174</td>
<td>.665</td>
<td>.006</td>
<td>-.033</td>
<td>.175</td>
<td>-.196</td>
<td>4.78 1.29</td>
<td>.798</td>
</tr>
<tr>
<td>Emotional stability</td>
<td>.387</td>
<td>.078</td>
<td>-.086</td>
<td>.652</td>
<td>.008</td>
<td>-.081</td>
<td>.069</td>
<td>4.55 1.18</td>
<td>.784</td>
</tr>
<tr>
<td>Openness to experience</td>
<td>.246</td>
<td>.374</td>
<td>.145</td>
<td>.012</td>
<td>.476</td>
<td>-.076</td>
<td>.018</td>
<td>5.11</td>
<td>.642</td>
</tr>
<tr>
<td>Transitions</td>
<td>-.089</td>
<td>.105</td>
<td>.035</td>
<td>-.076</td>
<td>-.06</td>
<td>.169</td>
<td>-.128</td>
<td>1.79</td>
<td>.096</td>
</tr>
<tr>
<td>Delinquency</td>
<td>.120</td>
<td>-.057</td>
<td>-.197</td>
<td>.051</td>
<td>.028</td>
<td>-.147</td>
<td>.574</td>
<td>1.75 2.06</td>
<td>.512</td>
</tr>
<tr>
<td>M SD (T1)</td>
<td>4.8</td>
<td>5.64</td>
<td>4.41</td>
<td>4.41</td>
<td>5.06</td>
<td>0.07</td>
<td>2.48</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.15</td>
<td>0.61</td>
<td>1.04</td>
<td>0.82</td>
<td>0.31</td>
<td>5.11</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Correlations in bold are significant at \( p < .05 \) level.
Growing up: How personality maturation and adult role transitions relate to desistance from delinquency

The models were run with maximum likelihood estimation with robust standard errors. The indirect effects were estimated in Mplus by multiplying the coefficients of paths $a$ and $b$, following the approach of Hayes (Hayes, 2009), which provides a statistical test of mediation. Standard errors of the indirect effects were calculated in Mplus using the multivariate delta method (Bollen, 1987). See Hoeben and Weerman (2016) for a previous application of this method.

5.4 Results

Table 1 presents descriptive statistics and correlations between all variables at T1 and T2. Looking at the personality measures, extraversion, conscientiousness, and emotional stability are highly stable over time (coefficients above .6), agreeableness and openness to experience slightly lower stability (.4 and .5). Results of paired samples t-tests indicated that whilst mean scores of extraversion and openness to experience did not significantly differ between T1 and T2 (both $p > .1$), conscientiousness ($t(283)=7.279, p < .001$), agreeableness ($t(283)=4.085, p < .001$), and emotional stability ($t(283)=2.576, p = .011$) all significantly increased over time. The ICCs indicate that the majority of variance in the personality variables is explained by differences between-individuals. Delinquency falls significantly between T1 and T2 ($t(283)=-0.754, p = .002$), and the correlation between the two scores indicates quite high relative stability over time (.5). The ICC indicates that about half of the variance in delinquency is explained by differences between-individuals and half by differences within-individuals over time. A small minority of participants transitioned into adult role(s) prior to T1 (6%), whilst at T2 the majority had transitioned into at least one adult role (92%), with a third having transitioned into two adult roles (30%), and a quarter having transitioned into 3 or more adult roles (27%). The ICC for adult role transitions indicates nearly all variance is explained by differences within-individuals over time. Adult role transitions were significantly, but weakly correlated with agreeableness and conscientiousness at T2.

Table 2 presents the correlations between the within-individual change variables for each of the personality factors, adult roles transitions, and delinquency. These results indicate that change in agreeableness and adult role transitions are correlated. Change in conscientiousness, adult roles transitions, and changes in delinquency are all correlated with each other. Based on these results, multilevel models examining the paths between changes in conscientiousness, adult role

25 Personality scale values cannot be meaningfully interpreted. We therefore do not attempt to interpret the coefficients in our models.
transitions, and changes in delinquency were tested. Within-individual change variables for the other personality factors were included as control variables in the models.

First, we inspect the total effect of each variable on the other. Adult role transitions significantly predict increases in conscientiousness ($\beta=0.243$, $SE=0.044$, $p<.001$) and increases in conscientiousness significantly predict adult role transitions ($\beta=0.303$, $SE=0.052$, $p<.001$). Delinquency is a significant negative predictor of conscientiousness ($\beta=-0.072$, $SE=0.035$, $p=.042$). Delinquency is a significant negative predictor of adult roles transitions ($\beta=-0.091$, $SE=0.046$, $p=.048$). However, neither conscientiousness nor adult role transitions significantly predict delinquency. In tests for indirect relationships, there was evidence of mediation in one model. The relationship between delinquency change and adult role transitions was fully mediated by changes in conscientiousness ($\beta=-0.010$, $SE=0.004$, $p=.002$). See Figure 1. (Full results tables in Appendix C).

**Table 2.** Correlations between within-individual changes in personality, adult roles transitions, and delinquency

<table>
<thead>
<tr>
<th></th>
<th>Extraversion</th>
<th>Agreeableness</th>
<th>Conscientiousness</th>
<th>Emotional stability</th>
<th>Openness to experience</th>
<th>Transitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraversion</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agreeableness</td>
<td>.032</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>-.017</td>
<td>.052</td>
<td></td>
<td>.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional stability</td>
<td>.071</td>
<td>.014</td>
<td>.005</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openness to experience</td>
<td>.044</td>
<td>.041</td>
<td>.020</td>
<td>-.005</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Transitions</td>
<td>-.022</td>
<td>.072</td>
<td>.218</td>
<td>.048</td>
<td>-.001</td>
<td>-</td>
</tr>
<tr>
<td>Delinquency</td>
<td>-.037</td>
<td>-.071</td>
<td>-.200</td>
<td>-.008</td>
<td>-.054</td>
<td>-.259</td>
</tr>
</tbody>
</table>

Note: significant correlations in bold at $p<.05$ level.
5.5 Discussion

Different aspects of the relationships between personality change, delinquency change, and transitioning into adult roles have been considered by both personality and life-course criminology theories and have been the subject of numerous empirical studies over the years. However, to date, the interrelation of all three of these factors has not been examined in emerging adulthood, a time when we see both dramatic mean level changes in personality and delinquent behavior, and when young people start to transition into adult roles. Indeed, in our sample we saw significant increases in personality maturation and decreases in delinquency between our two-time points, as expected. Furthermore, by the second time-point, when aged on average 24 years, the majority of our sample had transitioned into at least one adult role. Exploring how personality maturation and transitioning into adult roles relates to declines in delinquency was the goal of this paper. We found that the relationship between decreases in delinquency and transitioning into adult roles was explained by increases in conscientiousness.

When looking at within-individual change, of all five personality factors, conscientiousness was the only one to be correlated with both adult roles
transitions and delinquency. Looking at the paths between these three factors we found that a decline in delinquent behavior between the two time-points in our study predicted an increase in conscientiousness between the two time-points. This finding supports the scar model of personality and antisocial behavior, whereby changes in delinquent behavior are associated with changes in personality, albeit in this case in a positive direction, i.e., decreases in delinquency are associated with personality maturation. This corroborates previous evidence for this model found in adolescence, using multiple time points, and looking at personality facets rather than the broader traits that we examine (Klimstra et al., 2010; Klimstra et al., 2014). Although we cannot be sure whether the decline in delinquency preceded the increase in conscientiousness, as conscientiousness has consistently been related to delinquent behavior in cross-sectional studies it is interesting to find that over time decreases in delinquency behavior have this positive association with conscientiousness. That changes in these two areas are associated seems to support previous findings on their co-development during emerging adulthood (Blonigen et al., 2010).

Next, we turn to the relationship between adult roles and delinquency. We found that declines in delinquent behavior between the two time-points predicted transitioning into adult roles between the two time-points. To our surprise, we did not find the opposite, that transitioning into adult roles predicted a decrease in delinquent behavior in our sample of emerging adults. This may be a consequence of using a general population sample, in comparison to many previous studies which have used high risk samples (e.g., van der Geest, Bijleveld, & Blokland, 2011). It is also possible that had we used a more qualitative measure of the adult roles our emerging adults transitioned into, for example, satisfaction with living situation and relationship or stability of employment, we may have found an effect. The life-course literature often emphasizes, for example, the ‘good marriage effect’, highlighting the importance of marriage quality (Laub, Nagin, & Sampson, 1998; van Schellen et al., 2012). Furthermore, Laub and Sampson (2003) stress that role stability is necessary for desistance. Our measure of transitions into adult roles did not take into account quality or stability of the roles transitioned into. This is clearly an area that future research should address to determine whether some measure of the quality of adult roles transitioned into predicts delinquency desistance during emerging adulthood.

Whilst our findings do not fully support the life-course theories of Sampson and Laub or Moffitt, they are, however, in line with one life-course theory of desistance discussed. We found not only that declines in delinquency predicted whether our emerging adults transitioned into adult roles, but that this relationship was explained by increases in conscientiousness between the two time-points. This finding lends cautious support to the cognitive transformation theory of desistance
(Giordano et al., 2002), whereby cognitive change is required in order for adult roles to aid desistance. From our findings, it appears that the Gluecks were right: declining delinquency is associated with psychosocial maturation, specifically, increases in conscientiousness (psycho) and transitioning into adult roles (social).

It could be argued that our interpretation of the cognitive transformation, as an increase in conscientiousness, is not entirely in line with how the authors of the theory construe this. What exactly this cognitive transformation is remains somewhat ambiguous on reading Giordano and colleagues 2002 paper. This cognitive transformation could be viewed as a conscious change in motivation or identity, rather than as personality maturation, which is likely a more unconscious process. The two key findings that we use to support our interpretation are that, first, change in delinquent behavior predicts transitioning into adult roles, suggesting that declines in delinquent behavior are necessary to enter the roles, and second, that an internal change occurs, namely a switch towards increased levels of conscientiousness, which is associated with both delinquency change and adult roles. These findings indicate that a transformation in behavior and personal characteristics is needed to enter adult roles, and we feel conform to the idea of a cognitive transformation and thus support the theory.

Our findings have several theoretical and practical implications. The main implication in terms of theory is that, in our interpretation, cognitive transformation theory of desistance appears to be particularly relevant to emerging adults. This finding may be a feature of our use of a general population sample. As the personality literature and the age-crime curve attest to, personality maturation and desistance from delinquency is normative for this age group. That these two aspects predict transitions into adult roles may reflect this normativity. This may simply indicate that these young people are growing up, an inevitable psychosocial maturation. This population may not, as might be the case for more serious offenders, require social control to be enforced by a spouse or employer to act as a catalyst to behavior change. However, this suggestion implies that, other than time, little is needed to ensure desistance, maturation, and transitioning into adult roles, as these are normative occurrences for the majority of emerging adults. We did see, however, considerable inter-individual variation in personality change, delinquency change, and in the pathway into adult roles. Our findings indicate that individuals who do not desist, who do not increase in conscientiousness, are at risk of missing the boat to adulthood, i.e., not transitioning into adult roles.

5.5.1 Limitations and future research
We have chosen in this study to use an aggregate measure of adult roles transitions and of delinquency. We were interested in both the cumulative effect of adult roles, rather than specific roles, as well as the effect on delinquency in general, rather
than specific subtypes of delinquency. The theories of why transitioning into adult roles leads to changes in personality (Roberts, Caspi, & Moffitt, 2001) and why transitioning into adult roles leads to desistance (Sampson & Laub, 1993), do not explicitly distinguish between different adult roles or different type of delinquency; hence our choice to aggregate. However, future research could focus on this issue. It is possible that certain adult roles have stronger effect on certain personality traits, or that only emerging adults that engage in a particular type of delinquency desist in response to adult roles.

Another important point to address is the temporal structure of our data. We have examined relationships between change in personality and change in delinquency measured at two time-points and the transitions into adult roles that occurred between these two time-points. We cannot know exactly when in the six-year period between time one and time two the changes in personality took place or when the decreases in delinquency took place. In order to make more exact statements about the temporal order of, for example, desistance from delinquency, increases in conscientiousness, and transitioning into adult roles, and therefore also about cause and effect, we would need to use three or more, ideally evenly spaced, proximal measurement points. We would then be able to examine, for example, adult roles and delinquency over the same 12-month time period. With our current data structure, whether changes in delinquency occurred prior to adult role transitions, whether they caused the transitions, is not certain. However, our argument that change is necessary in order to transition into adult roles is strengthened by the fact that transitioning into adult roles did not predict decreases in delinquency. Nevertheless, these issues would clearly be a fruitful area for future research with this age group.

5.5.2 Conclusion

Our findings indicate that delinquent behavior change and changes in conscientiousness are associated with transitioning into adult roles. We have argued that this supports the cognitive transformation theory, whereby in order to be able to make the most of the hooks for change offered by adult roles individuals need have more mature personalities and show a decline in delinquent behavior. We believe we have extended the scope of the theory by applying it to a mixed gender, general population sample and hope that this acts as a spur for future research in the area of cognitive transformations and desistance.